FIRST IN THE FIELD

Offshore

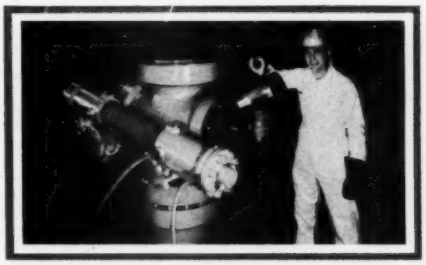
ZAPATA DRILLS FROM FLOATING VESSEL
See Page 13

PRESSURE WAS NO PROBLEM FOR COLONEL DRAKE

He simply didn't hit it. At Spindletop they let 'em gush — it spelled success. But in the early 1920's penetration of high pressure gas zones was not just a problem, it was a real peril. Available equipment could not control the ever increasing pressure.

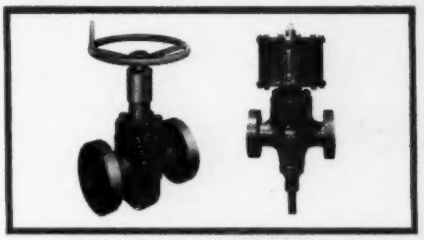
Jim Abercrombie of Houston was one of the operators who had experienced the blazing destruction of uncontrolled gas pressure. He decided to do something about it, and shortly the first successful blowout preventer was making news wherever pressure had been a problem. For the first time rigs, reserves and roughnecks were safe from the danger that had been considered an act of God. Operators were free to probe deeper for more pay.

These first preventers were made in Mr. Abercrombie's newly acquired Cameron Iron Works, the year was 1922. Intervening years at Cameron have seen continuous research and design development of pressure controls for drilling and production. Staying ahead of a problem which never ceases has made Cameron equipment important throughout the oil producing areas of the world—wherever operators must protect personnel and profits.

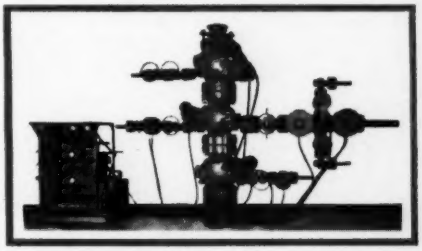


Type "F" Blowout Preventer with pressure balanced design is positive protection for any drilling operation.

Our first preventer was designed for 1500 psi W. P. with 3000 psi test; our latest will control ten times as much pressure — 15,000 psi and is tested to 22,500 psi. Many related developments have resulted from our research. The most outstanding of these is a new manufacturing process — the Cameron split-die forging method. The original shop handled machine work almost exclusively. Today we make our own steel, forge, heat-treat, machine, assemble, and test. Our activities include production of components for atomic reactors, jet engines, guided missiles, and, of course, Cameron pressure controls for drilling and production.



Cameron Gate Valves offer the longest maintenance free operation of any valve on the market today.



Cameron Control Panel employs a diagram of the entire preventer hookup for safe, easy operation.

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wells under

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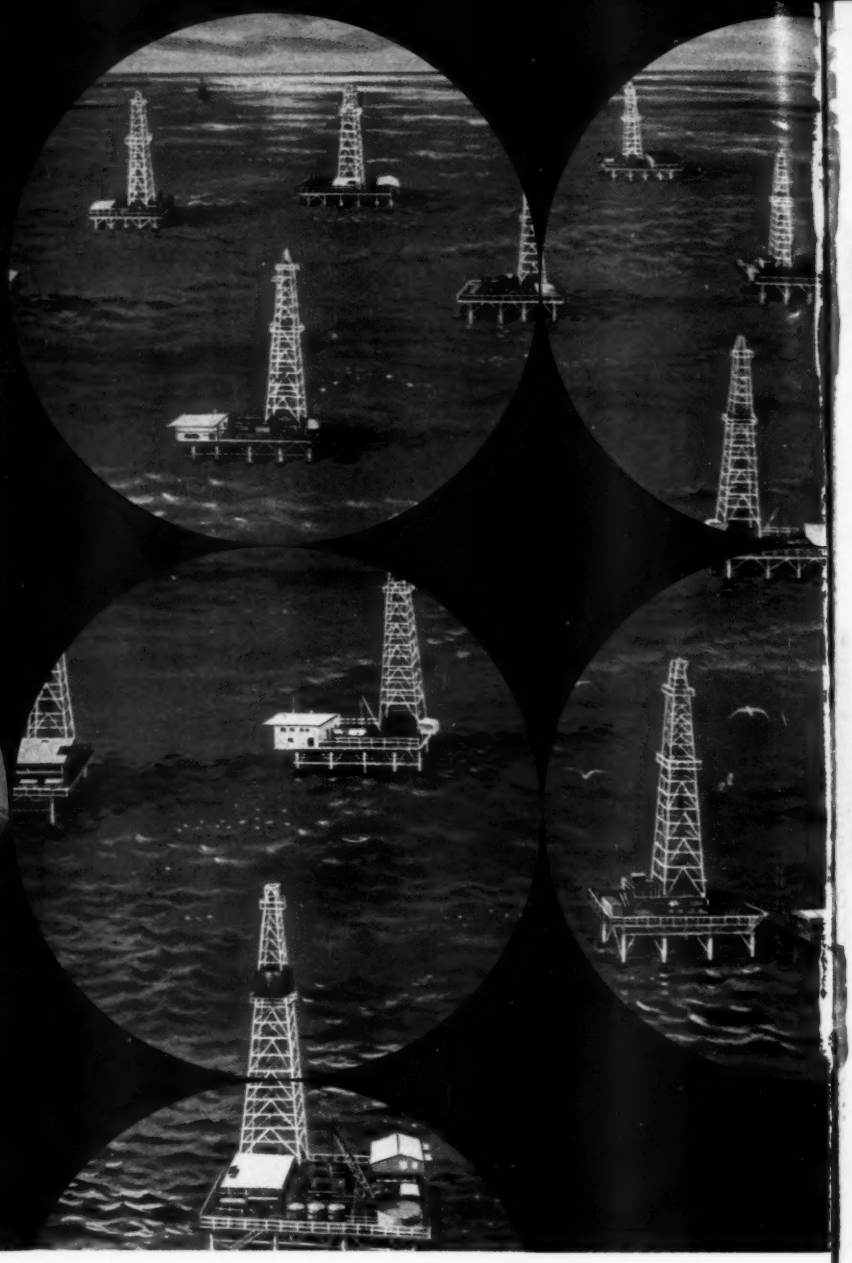

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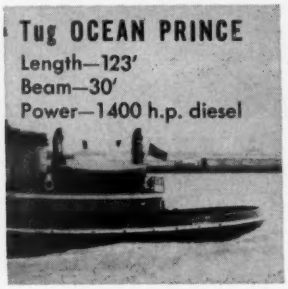

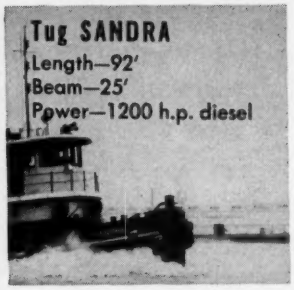

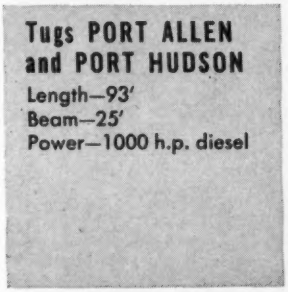

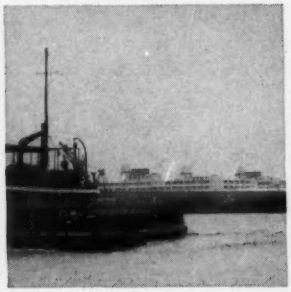

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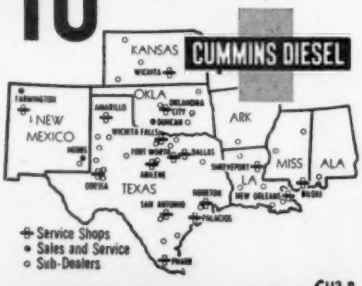

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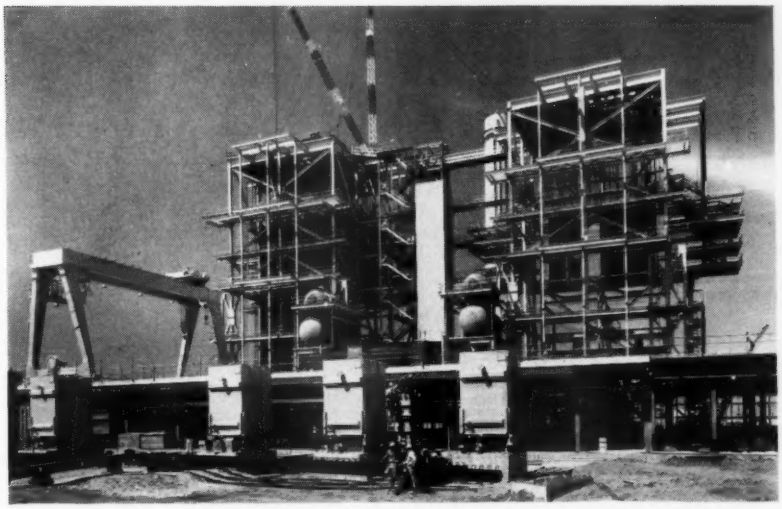
FRESH WATER NEWS

from Cleaver-Brooks Special Products, Inc.

CAPSULE REPORTS AND INFORMATION ON THE PRODUCTION OF FRESH WATER FROM THE SEA

Pilot plant in California may open new era in salt-to-fresh water conversion



In a contract recently awarded to Cleaver-Brooks Special Products, Inc., the Southern California Edison Company embarked on a far-reaching program for conversion of sea water to fresh water. The contract calls for construction of a sea water distillation plant with a capacity of about 100,000 gallons a day. It will be operated in conjunction with existing steam generating facilities at the Mandalay Steam Station near Oxnard, Calif. The operation will be the first of its kind in the country.

In awarding the contract, Southern California Edison revealed that Cleaver-Brooks Special Products had made its bid on an evaporator based on a new principle which greatly reduces required heat transfer surface and pumping power. The new unit can be used for both distillation through use of residual heat in cooling water and for distillation using steam extracted from the turbine.

Success of the pilot plant will signal a significant step forward toward the tapping of ocean water for use in home, industry and agriculture. However, Edison officials caution that at this time the water produced by the pilot plant is not expected to compete in cost with fresh water from natural present sources. The hope is that similar installations will eventually be advantageous to use in areas where current water costs are high.

Upon completion of construction, Cleaver-Brooks engineers, who worked with Edison in designing the job, will continue to cooperate in its operation.

NEW CONSTANT CAPACITY EVAPORATOR CAPTURES WASTE DIESEL HEAT TO SUPPLY FRESH WATER FOR OFF-SHORE RIGS

A new high-capacity waste heat evaporator for off-shore drilling rigs and tenders has been developed by Cleaver-Brooks Special Products, Inc.

Operating from waste heat of generator-driving diesels, the new flash type unit manufactures fresh water from sea water at constant output. And output is independent of drilling operations.

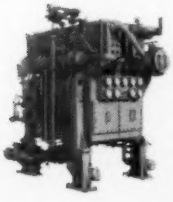
Costs are kept low due to conservation of fuel and unusually low maintenance requirements.

The heat required for evaporation is derived from the diesel engine cooling water. The flashing principle utilized by the new unit eliminates scaling problems common with conventional evaporators. Maintenance usually involves only simple brush-out after prolonged periods of operation.

As installed, the unit can provide pure water for drinking, drilling, make-up, bathing and cooking.

ENGINEERS EXPLAIN HOW NEW METHODS, MATERIALS CUT COSTS, REDUCE UNIT SIZE

According to Cleaver-Brooks engineers, savings of 30% on unit volume and 20% on unit costs are possible through new design and construction of the company's evaporation and distillation equipment.



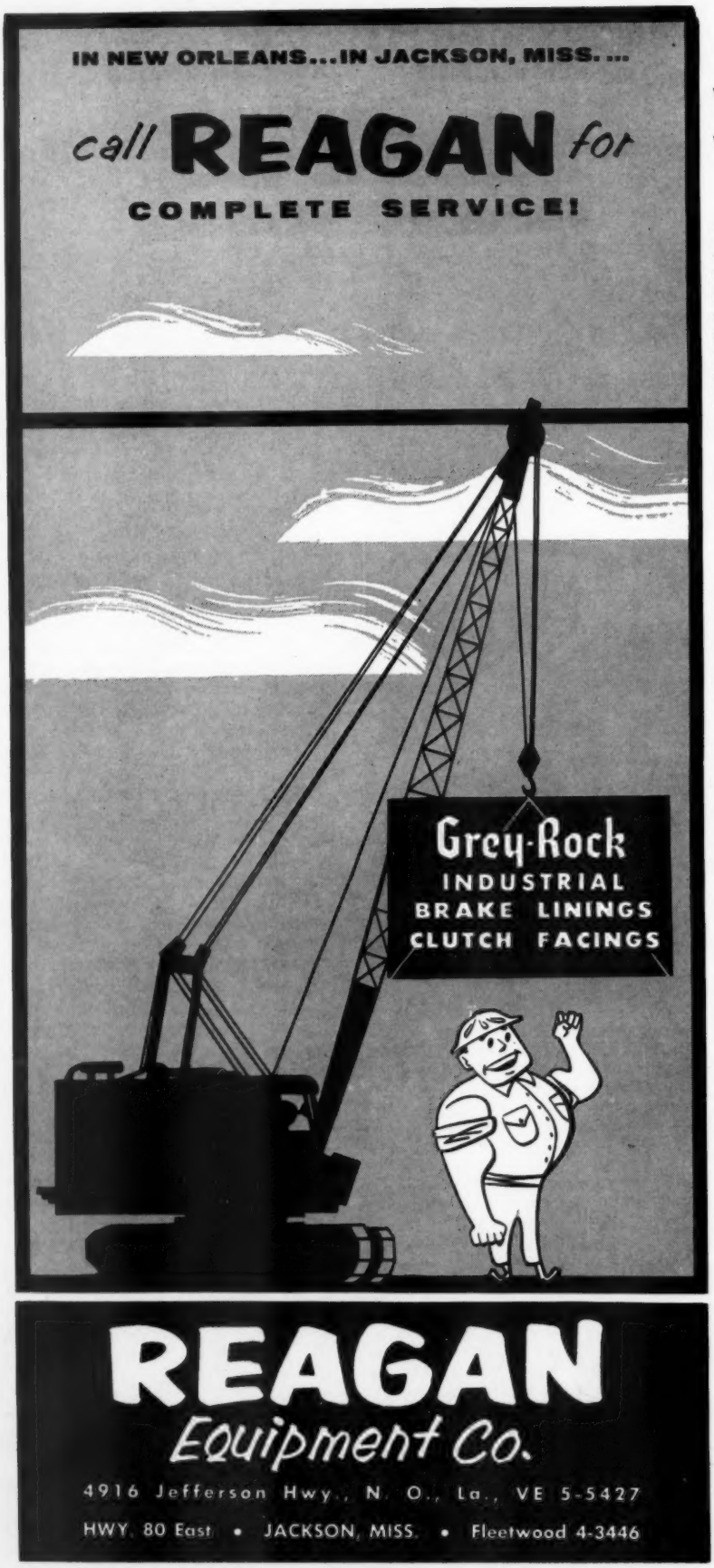
For example, the deck space needed for a 12,000 gpd flash evaporator has been reduced from 70 sq. ft. to 55 sq. ft., height cut by 12%.

On the cost side, improved design using equally reliable but lower-cost materials and improved manufacturing techniques — resulted in cost cuts of 20% on one model.

Today, Cleaver-Brooks flash evaporators get one-eighth grain of sea salts per gallon of sea water rather than the usual residue of one-fourth grain per gallon — a 50% improvement in effectiveness.

Cleaver-Brooks Special Products, Inc.

225 Grand Avenue, Waukesha, Wis.



Way offshore . . .

With the Publisher

I'm reminded of the cable-tooling outfit some'eres out in West Texas who tapped an oil sand last week at less than 2000-ft., and stood back with their mouths open as a gusher blowed the string of tools out of the hole. According to reports, the well blew at something like 100,000 bbls. a day—phew!—for the day or less it took to shut it in.

Well, I wasn't exactly cable-tooling, and the dirt I hit doesn't have as rich a rainbow color. But it is a strike!

What I'm hollering about, I sold another book last week—a pocketbook, that is. I guess you'd call it a western, since the title is "Johnny-Behind-The-Gun." But it ain't so much a western as an adventure story laid out West.

That makes three in less than a year—a hardback and a couple of pocketbooks, and I hope some of you oilfield peckerwoods are reading them. If somebody writes in saying I don't know any more about writing a story than a monkey does pushing tools—well, I'll know the books are being read, and I'll have an excuse to pass along the story Orville Scott (our editor) told me.

Seems a rig runner in Sumatra or some such place was having labor trouble. The superstitious natives wouldn't climb the tower or anything, so he was having to mount the monkeyboard himself. In desperation, he finally trained a chimpanzee to do the job. The chimp got so good, the fellow was able to go back to the States for a vacation.

But soon after he returned, a friend dropped by and was startled to find him back on the monkeyboard.

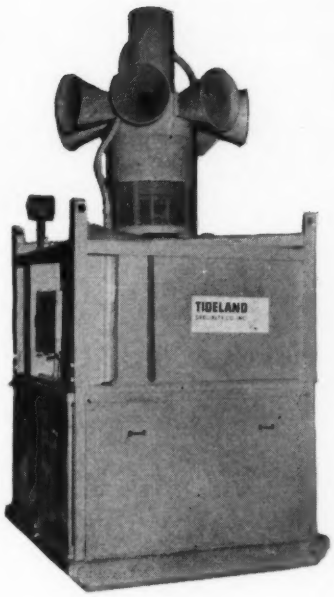
"What happened to the chimp?" he wanted to know. "I thought he was making a real derrickman."

"He did," was the bitter reply, "— so good he's been promoted to toolpusher!"

Before some toolpushers get incensed and toss insults back at us, it's all in fun and we'll sign off hastily.

See you next month!

Long John Latham



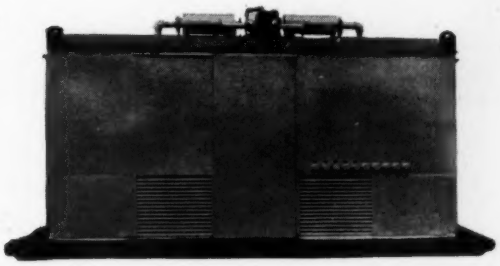
DS-2

TIDELAND ANNOUNCES . . .

GREATEST SOUND OUT-PUT EVER IN CLASS "A" FOG SIGNAL!

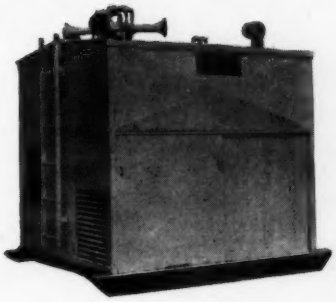
The Tideland Model DS-2 represents the first successful application of the siren principle to two mile fog signals, producing a higher sound output with lower power input. This dependable unit occupies only 28 square feet of deck space, and is transportable by crew boat in several sections weighing less than 1,000 pounds each. Powered by American M.A.R.C. Diesels, the DS-2 outperforms conventional units with lower transportation, lower operation, and lower maintenance costs.

DAG-2



The Tideland Model DAG-2 Class "A" Fog Signal Unit fulfill's every requirement for a multi-purpose two-mile fog signal, incorporating auxiliary power for cathodic corrosion protection, sand-blasting and painting., Powered by General Motors Diesels driving Westinghouse compressors and Federal air horns.

DA-2



The Tideland Model DA-2 Class "A" two-mile Fog Signal Unit is a complete dual unit proved in rugged service for more than three years. Powered by Continental Diesels driving Schramm compressors and Federal air horns.

ALL TIDELAND CLASS "A" FOG SIGNALS COMPLY WITH U.S.C.G. REQUIREMENTS (33 CFR 67.10)

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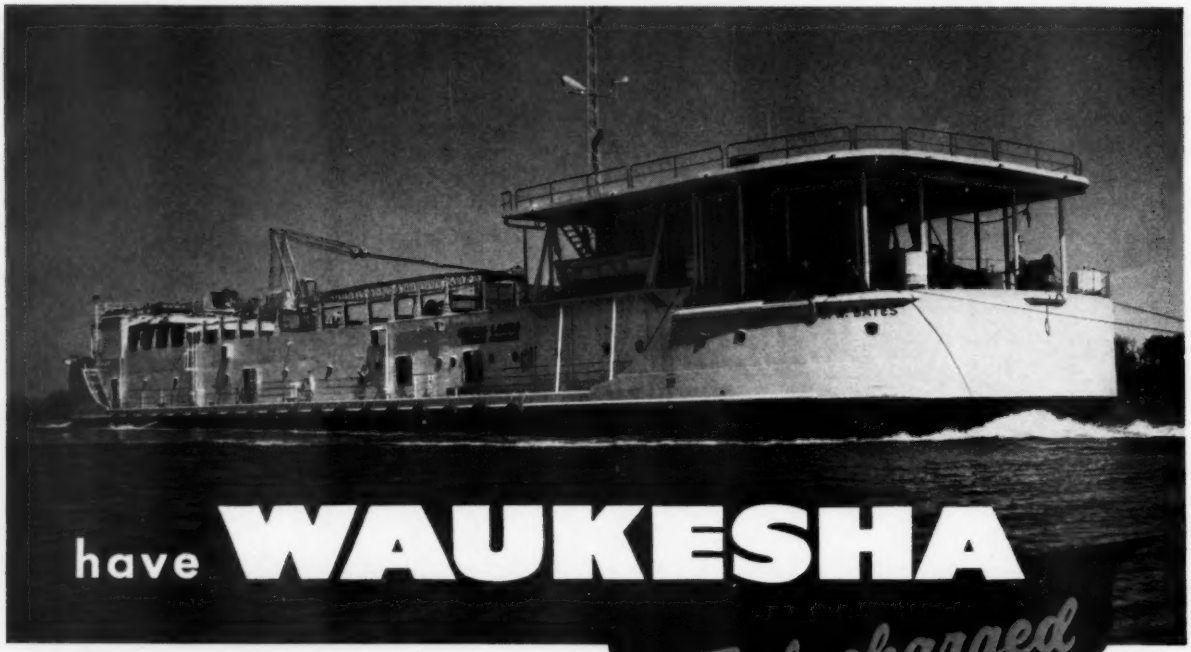
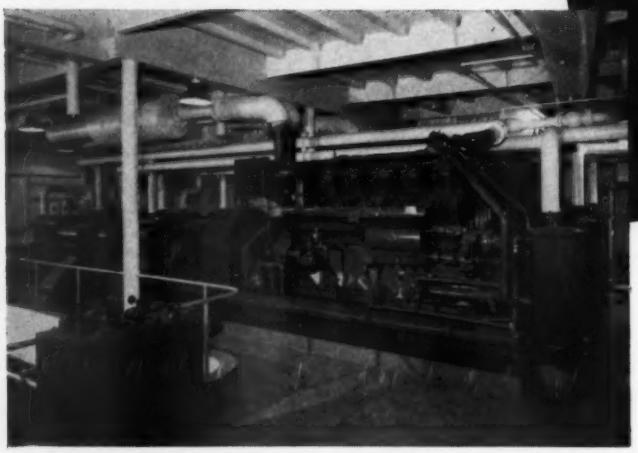
OFFSHORE DRILLING TENDERS



have **WAUKESHA** *Turbocharged* DIESELS



(above) Drilling tender J. W. Bates uses (left) three WAUKESHA Model VLRDBS Turbo-Supercharged DIESELS— 12-cylinder, 60-degree vee, four cycle, 8½ x 8½-inch bore and stroke, 5788 cu. in. displacement, with counterbalanced crankshafts. Send for Bulletin 1663.

Reading & Bates Offshore Drilling Co., of New Orleans and Tulsa, have two drilling tenders, the *J. W. Bates* and *George M. Reading*—260′ long; 54′ wide; molded depth, at sides, 16′3″. The tenders operate offshore, one in the Gulf of Mexico, the other in the Gulf of Persia, at a distance of 40-75 miles. Both use Waukesha V-12 Turbocharged Diesels.

Pictured above are the tender *J. W. Bates;* and its three VLRDBS Waukesha V-12 Turbocharged Diesels driving the National Supply Company's largest mud pumps (No. 2-G-1000) through a three-section National gyrol compound with two-speed drive.

An official of Reading & Bates says, "The Waukesha V-12 Turbocharged Diesels, through their dependability and economical operation have earned the confidence and approval not only of the drilling crew personnel but of the entire Reading & Bates organization."

416

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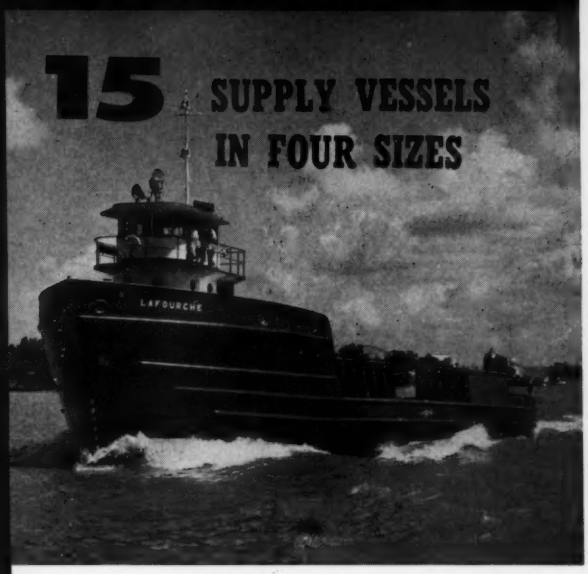
65 footers

15 SUPPLY VESSELS IN FOUR SIZES



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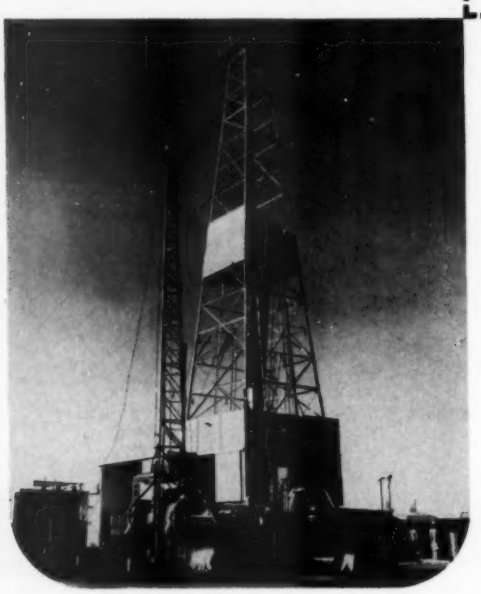
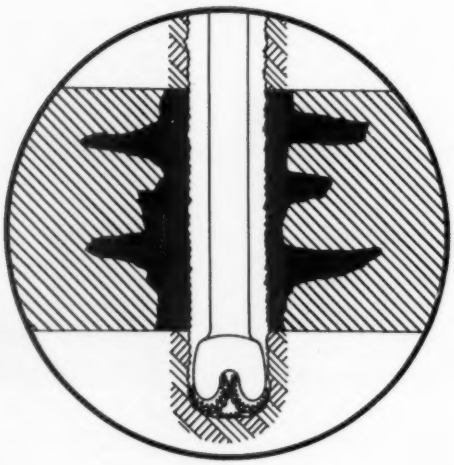
HALLIBURTON HYDRO-LOK



THE ANSWERS TO BETTER WATER CONTROL

A major problem in air and gas drilled wells is the control of in-flow water. Halliburton HYDRO-LOK . . . a group of three effective water control agents has been specifically developed to help solve this troublesome problem.

HYDRO-LOK (PC-11) consists of a thermosetting resin and inert solids. It forms an insoluble plug having high compressive strength, resulting in an effective seal . . . May be placed like cement slurry, either dumped with bailer or pumped opposite the formation by the two-plug method. When the squeeze pressure is applied, the resin enters the formation where setting is accelerated on contact with interstitial water . . . Adaptable for zones of high permeability, fractured sandstones and limestones. Because of the low viscosity of the resin phase in the slurry, relatively long sections of water producing horizons with varying permeability may be treated.



HYDRO-LOK (HG-10), the resin used in PC-11, contains no inert solids; therefore, its primary application is for conditions where maximum resin penetration is required.

HYDRO-LOK (PWG) is a low viscosity fluid that sets to form a stiff gel. The low viscosity is maintained for 95% of its pumping time, aiding entry into the true permeability of the water bearing formation. When PWG enters its setting phase, an extremely stiff gel results in less than an hour, thus minimizing costly rig downtime. Other advantages of HYDRO-LOK (PWG) include:

- **Holding back relatively high formation pressure.**
- **Adjustable to well temperatures from 32° to 200°F.**
- **Nature of set minimizes danger of sticking tools.**
- **Is insoluble in water, acid or oil.**
- **Still sets satisfactorily when diluted as much as 50% by formation water.**
- **Also useful in grouting operations and in mine shafts.**

The Halliburton HYDRO-LOK group of materials has demonstrated water control effectiveness in many field applications. For better water control in air or gas drilled wells *and* grouting operations, specify Halliburton HYDRO-LOK.

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Zapata Off-Shore Company

Drills 9,002-Ft. Well From Floating Vessel

Thirteen days, seven hours to total depth is new world's record for drilling from a floating vessel, company states they can "drill to 15,000-ft. in 200 feet of water more economically than any other system now in use"

While others talk about slashing costs of overwater drilling, Zapata Off-Shore Company of Houston is doing something about it.

Using a converted YF drilling tender, the **Nola 1,** Zapata has successfully demonstrated a new technique that may revolutionize the economics of offshore drilling.

Mounting a conventional drilling rig cantilevered from the main deck amidships, **Nola 1** slammed down a hole in 35 feet of open Gulf of Mexico water to a total depth of 9,002 feet in just 13 days, 7 hours—a new world's record for drilling an oil well from a floating vessel.

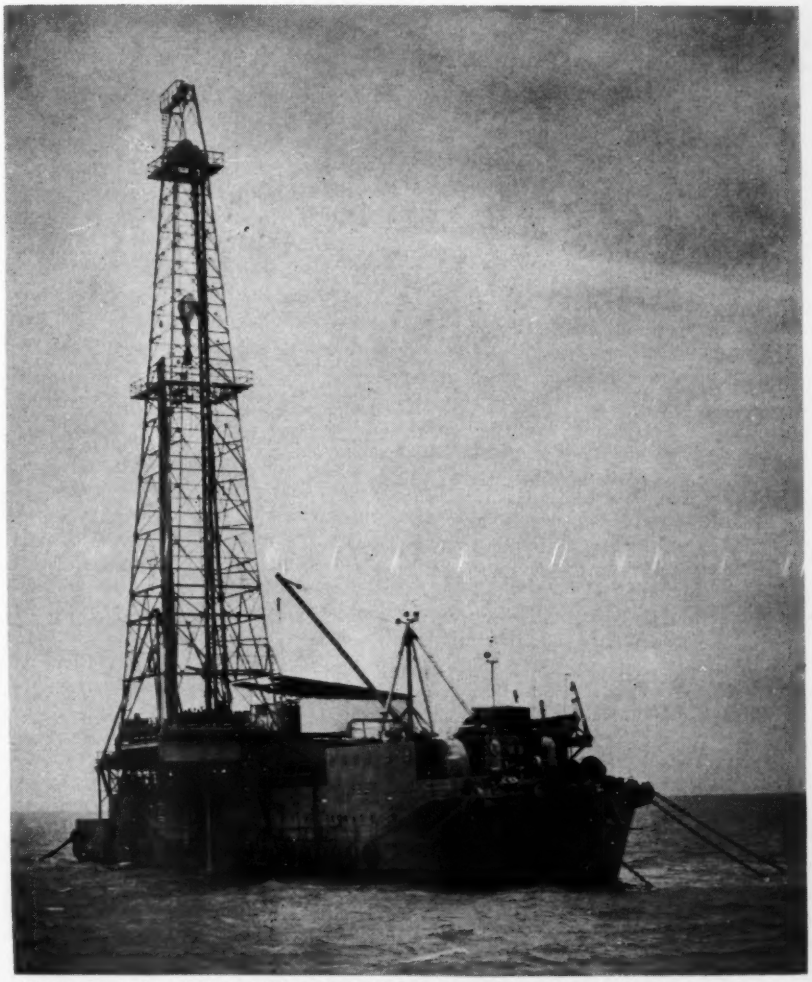
Others have drilled core holes, but Zapata's No. 1 State Lease 2548 in Block 51 of the West Delta area, off Louisiana's Plaquemines Parish, is the first test for oil drilled from a floating vessel in the Gulf of Mexico.

The well was drilled with 4½-in. drill pipe, with 10¾-in. casing set to 1500 feet. If the test is successful, a conventional string of casing will be set to the bottom.

Rate of penetration, as far as intensely interested oil industry observers are concerned, has been phenomenal for a new and untried rig. Oilmen have flown in from all up and down the Gulf Coast, and from as far away as Venezuela, Trinidad and Holland, to watch the **Nola 1** make hole at a rate that would be considered good for a fixed platform or mobile unit operation.

Moreover, elapsed time from spudding in to total depth rivals drilling rates for a similar land operation.

While Zapata talked little until



IN 35-FT. OF OPEN GULF OF MEXICO WATER, this floating vessel, NOLA 1 of Houston, has pioneered new techniques in marine drilling that are attracting world-wide attention.

their new method had been given a trial, here is what they now say:

- That the **Nola 1**, being a free-floating ship, can be moved quite rapidly from one location to the next.
- That it can drill just as easily in 200 feet of water, to 15,000 feet.
- That in water depths in excess of 100 feet, no other system now in use can touch their method from a standpoint of economy.
- As a single unit, **Nola 1** can operate more cheaply than as a tender tied to a platform, for it eliminates the platform. And it can drill in deeper water than any mobile unit now in existence.
- In the Delta region and other areas, where soft bottom conditions can be tricky and dangerous for operation of mobile units, the method has tremendous inherent advantages.
- In lieu of a costly platform, the company has designed a simple "tripod" that permits completion of a well near the ocean surface, with a combined production and helicopter deck installed just above maximum wave action. Others—notably Standard of Texas—have completed wells in this manner, letting waves wash over the wellhead equipment.

Zapata has applied for patents on a number of features in connection with its new method. More will be said about the tripod, a major factor from the standpoint of both safety and cost-cutting.

How they did it . . . Zapata looked carefully at other floating vessel operations before deciding on its present method. The company felt there were disadvantages to drilling with blowout preventer equipment on the ocean floor, which points up the basic difference between Zapata's techniques and others.

Zapata keeps blowout preventer and completion equipment above water, contained in a structure which eliminates further expensive modification. The extreme low cost of the structure, Zapata feels, eliminates the need for multi-well platforms and more expensive directional drilling. Zapata would ring a field with its one-well tripods, with each well drilled vertically.

Simply stated, advantages of the method are that 1) structures would be much less expensive because they would not have to be built to withstand drilling loads; 2) only one hole would be drilled for each structure—vertically; and 3) there is an inherent safety factor that should have wide appeal to operators after several offshore disasters involving multi-well platforms.

The conversion . . . Nola 1 and the rig it now mounts have both seen prior service in tender-platform operations in the Gulf of Mexico. Zapata eliminated one of the three mud pumps used in normal platform operations, and mounted the rig amidships so that it drills over the starboard side of the vessel.

Some features of compensation for horizontal and vertical action remain secret. But for added stability, a 150-ft. sponson was added to the port side, plus a multiple anchoring system.

However, it is obvious that ample provisions have been made for compensating trim under varying drilling loads, for **Nola 1** has drilled successfully through 6-ft. seas and 30 mph winds. Moreover, Zapata plans a further adaption it feels will permit normal drilling operations under more adverse weather conditions.

Tripod . . . A key to the success of Zapata's new method of drilling from a floating vessel is the relatively simple tripod, which supports the blowout preventer and completion equipment just above the water line. Two of the legs are slanted, with piling driven through them. The conductor casing serves as a vertical third leg, so that in effect a well is drilled through a leg of the tripod.

Nola 1 is rigged-up to set these tripods, which are converted to one-well production platforms where wells are completed successfully.

The tripod is designed to withstand an impact of a freely floating 300-ton barge traveling at two knots. The drilling vessel can rotate a full 104° around the tripod.

Present operation . . . That the system can be further modified for economic reasons is illustrated by Zapata's approach to its first offshore well drilled by the floating vessel method. Water depth at the location is shallow — only 35 feet—so the company did not feel the cost of a complete tripod was justified unless the well was completed as a producer. The well was drilled through 24-in conductor casing, mounting blowout preventer equipment without additional support, with the two other legs of the tripod to be added later if it is a successful completion.

The conductor casing, as a matter of note, achieved a penetration of 197 feet below the mud line.

Adaption of the tripod . . . A major operator in the Gulf has borrowed the tripod idea from Zapata, for use with a mobile drilling unit. Zapata plans similar use of the tripod with its own mobile drilling units, **Scorpion and Vinegarroon.**

Nola 1 . . . Nola 1, a converted YF barge, has an overall length of 260 feet, a width of 56 feet and depth of 15 feet. The floating drilling rig features air-conditioned quarters for 42 men, and a heliport. For stability, it uses an 8-anchor system, with each of the anchors weighing 12,000 lbs.

Drilling equipment . . . Major drilling equipment aboard the **Nola 1** includes a National Type 130 1500 hp drawworks, two C-350 600 hp pumps, three GM 6-110 diesel twins with torque converters rated at 1500 hp total, and a Lee C. Moore 140-ft. x 30-ft. x 9-ft. 6-in. derrick with a 952,000-lb. API capacity.

Auxiliary equipment includes a Schlumberger OSU-C electric logging unit and Halliburton Dual T-10 a.c. cementing unit.

Storage . . . Nola 1 has pipe rack storage space for 250 tons. Storage is provided for 2000 bbls. of drilling water, 500 bbls. of potable water, 1600 lbs. of diesel fuel, 1200 bbls. of active mud and 3000 sacks of dry mud.

Tow . . . Nola 1 was towed to the West Delta Block 51 location by the **M/V Tilman J,** at an average speed of 4.7 knots. The **Tilman J** also serves the drilling operation as a supply ship. Arriving at the location, fog delayed spotting the **Nola 1** for an interval. But the vessel was moored at the drillsite, and the well spudded in on February 12.

First well . . . Zapata drillled Well No. 1, State Lease 2548, for its own account, to demonstrate its new floating vessel technique to the industry. In just seven days, **Nola 1** was drilling below 7,000 feet, when hard geological formations were encountered that slowed up the drilling rate. Conventional 10¾-in. casing was set at 1500 feet. In the event of production, 7-in. casing will be set to the producing zone.

Background . . . In other areas, notably California, core-drilling from floating vessels has become an accepted practice. Offshore from California, **CUSS I,** a converted ex-Navy YFNB barge, has operated in water depths ranging from 45 to 350 feet and has drilled core tests up to 6,200 feet. In a pattern of core holes drilled to an average depth of 5,000 feet, average time for **CUSS I** to reach total depth of 10 days. Of course, drilling conditions and formations may have been radically different, but both the **CUSS I** and **Nola 1** have contributed greatly to the progress of drilling from a float-

ing vessel by pioneering two entirely different methods.

CUSS I drilled through a well in the center of the vessel, with blowout preventer and wellhead equipment on the ocean floor. Using a similar method, Dominion Oil Company drilled to 10,800 feet in the Gulf of Paria. Drilling time for the hole, which was abandoned as dry, was four months and 18 days.

But Zapata is the first to drill a well to any considerable depth in the Gulf of Mexico from a floating vessel. Core tests have been drilled by Brown & Root and McClelland Engineers—to depths up to 3,000 feet from floating barges with rigs cantilevered over the side. But Zapata remains the only company to have drilled below 3,000 feet from a floating vessel in the Gulf of Mexico, and the only company to explore for oil with such a rig in the Gulf.

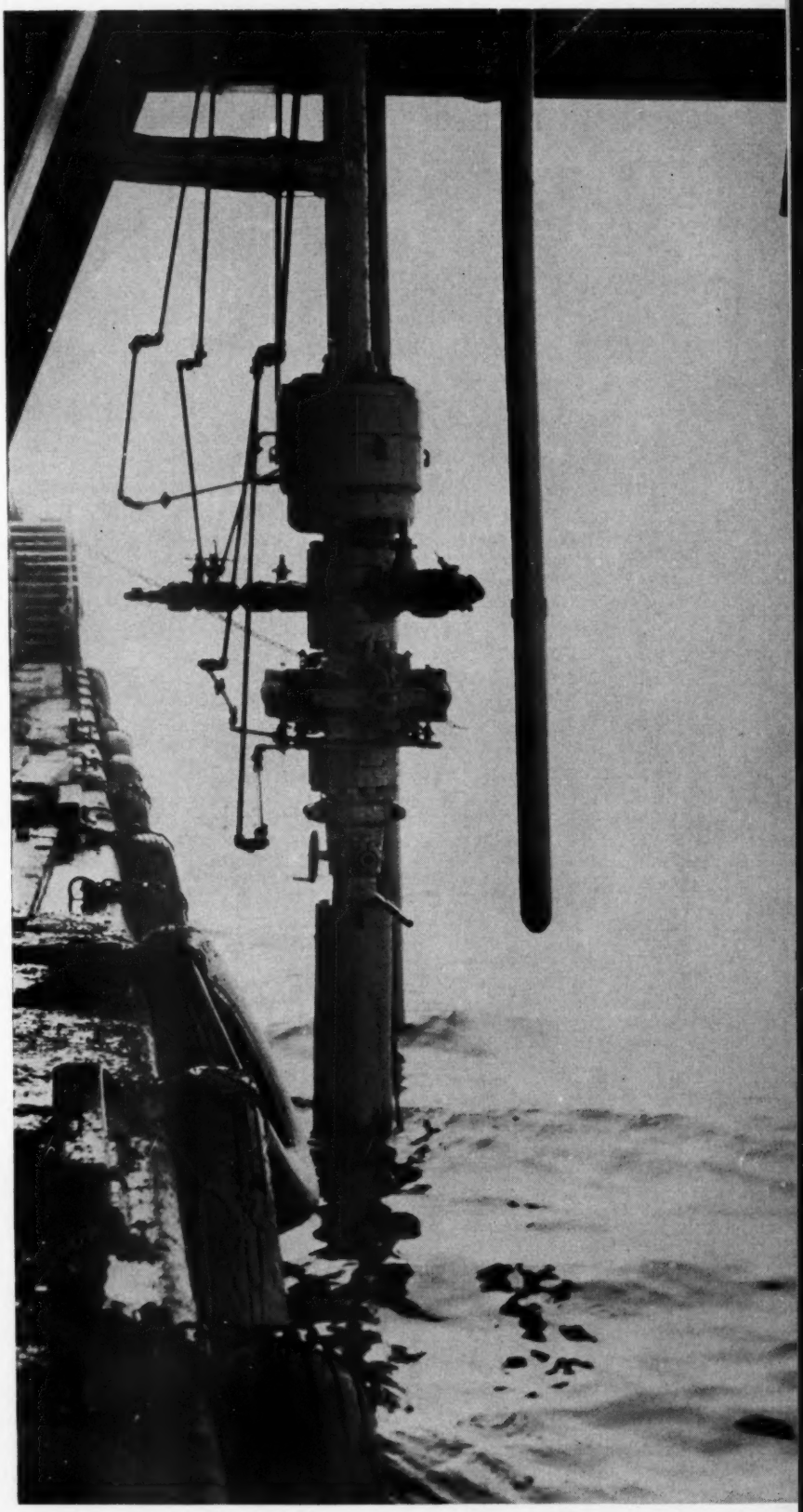
Moreover, the company is utilizing techniques familiar to Gulf of Mexico operators, with blowout, completion and wellhead equipment above water. There have been no underwater completions in the Gulf, as yet.

Far reaching implications . . . Success of the **Nola 1** on its first venture could have far reaching implications for the offshore industry. To begin with, it brings within reach of the oil drill many thousand inaccessible acres in Louisiana's oil-rich offshore regions alone—acres beyond the 136-ft. mark and beyond reach of any practical overwater drilling method heretofore demonstrated. Moreover, in water depths in excess of 100 feet, it promises by its very nature to be more economical than other present methods in use in the Gulf of Mexico.

But Zapata's techniques could work equally well anywhere in the world—off Mexico and Central and South America, and in the Persian Gulf and the China Sea.

It remains to be seen in just what depths the **Nola 1** can economically operate. Zapata's conservative statement is "in water depths up to 200 feet." But **CUSS I** has drilled in water depths up to 350 feet, and a particularly attractive offshore anomaly might spur Zapata to solve the problem of drilling in water deeper than 200 feet.

But the major present implication is stated in the opening paragraph of this article: Other people have talked of cutting costs of offshore drilling, while Zapata, a young, aggressive organization that pioneered use of LeTourneau-type mobile units in the Gulf, has seized the initiative and done something about it!



ZAPATA UTILIZES overwater completion technique. Above view shows conductor and surface casing, with blowout preventer equipment just below drilling deck.

For 66,937.82 acres

Louisiana's First Offshore Lease Sale In Nearly 3 Years Nets $43.6 Million

Average price per acre is $652.21—Shell makes high bid of $3000.05 per acre for 2000-acre Eugene Island area tract

Louisiana's first offshore lease sale in nearly three years proved that oil operators are ready to wager big money on the Gulf of Mexico.

Included in the $43,658,079.67 which oil companies paid the state for 66,937.82 submerged acres was one of the highest bids ever made on a Gulf of Mexico lease—over $6 million for 2000 acres in the Eugene Island area.

A total of 100,383.64 acres was advertised for lease. No bids were received on 16,885 acres and bids were rejected on 16,560.82 acres.

Thirteen companies and combines made successful bids—with the highest being the $6,000,100.00 bid made by Shell Oil Company for a 2000-acre tract in Block 7, Eugene Island area. A newcomer—General American Oil Company of Texas—bid $1,696,132.00 for State Lease 3524, comprising 1130 acres, also in the Eugene Island area.

Out of a total of 37 leases awarded at the sale, 22 were offshore. These were the bids accepted:

State Lease 3515, 175 acres in Block 5, Eugene Island area—$81,025.00 bid by Union Oil Company of California.

State Lease 3516, 900 acres in Block 6, Eugene Island area—$363,917.00 bid by Continental Oil Company, Atlantic Refining Company, Tidewater Oil Company and Cities Service Oil Company (CATC).

State Lease 3517, 2000 acres in Block 7, Eugene Island area—$6,000,100.00 bid by Shell Oil Company.

State Lease 3518, 2500 acres in Block 8, Eugene Island area—$2,000,100.00 bid by Shell Oil Company.

State Lease 3519, east half of Block 3, Eugene Island area comprising 2283.47 acres—$1,031,000.00 bid by Gulf Oil Corporation and Humble Oil and Refining Company.

State Lease 3520, Block 4, Eugene Island area comprising 4815.30 acres—$4,846,000.00 bid by Gulf Oil Corporation and Humble Oil and Refining Company.

State Lease 3521, 1525 acres in Block 28, Vermilion area—$152,000.00 bid by Shell Oil Company.

State Lease 3522, 1250 acres in Block 27 Vermilion area—$721,775.00 bid by Union Oil Company of California and Pan American Petroleum Corporation.

State Lease 3523, 1409 acres in Block 25, Grand Isle area—$156,400.00 bid by Hunt Oil Company.

State Lease 3524, 1130 acres in Block 27, South Pass area—$1,696,132.00 bid by General American Oil Company of Texas.

State Lease 3525, 435 acres in Block 3, West Cameron area—$32,651.00 bid by Superior Oil Company, Pure Oil Company and Sun Oil Company.

State Lease 3526, 911 acres in Block 3, West Cameron area—$100,216.00 bid by Superior Oil Company, Pure Oil Company and Sun Oil Company.

State Lease 3527, 450 acres—$28,502.57 bid by The California Company and Zapata Off-Shore Company.

State Lease 3528, 2135 acres in Block 24, West Delta area—$3,031,000.00 bid by Gulf Oil Corporation and Humble Oil and Refining Company.

State Lease 3529, 1800 acres—$1,031,000.00 bid by Gulf Oil Corporation and Humble Oil and Refining Company.

State Lease 3530, in Block 4, West Delta area comprising 2340 acres—$257,400.00 bid by Union Oil Company of California.

State Lease 3531, 600 acres in Block 3, Eugene Island area—$100,200.00 bid by Sunray Mid-Continent Oil Company, Skelly Oil Company and Tidewater Oil Company.

State Lease 3532, 2660 acres in Block 2, East Cameron area—$3,660,425.60 bid by J. Ray McDermott and Company, Inc., Phillips Petroleum Company and Kerr-McGee Oil Industries, Inc.

State Lease 3533, 600 acres in Block 9, East Cameron area—$60,000.00 bid by D. D. Harrington.

State Lease 3534, 805 acres in Block 16, East Cameron area—$2,002,500.00 bid by Shell Oil Company.

State Lease 3535, 950 acres in Block 17, East Cameron area—$1,489,712.00 bid by Tennessee Gas Transmission Company.

State Lease 3636, 250 acres in Block 23, East Cameron area—$75,000.00 bid by Shell Oil Company.

Of the leases awarded, 22 were offshore and 15 were inshore tracts—but most of the latter were submerged lands. In all, the 37 leases netted the state approximately $59 million.

Alaska

General Petroleum to Drill Wildcat in Bristol Bay Area

A wildcat will be drilled on Alaska's west coast 35 mi. from any active drilling by General Petroleum Corporation.

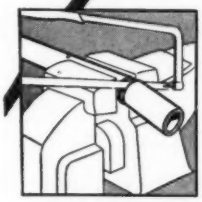
The test will be drilled in the Bristol Bay area on acreage owned by Great Basins Petroleum Company at an undisclosed site. General Petroleum has not disclosed any date for spudding the well.

Last summer General Petroleum

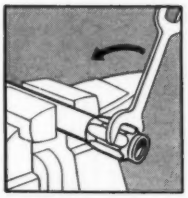
Make up hose lines in the field... *FAST*...

with STRATOFLEX

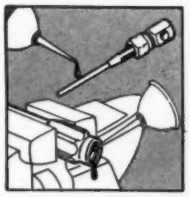
BULK HOSE • REUSABLE FITTINGS



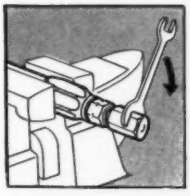
1. Cut hose to desired length



2. Screw on socket counterclockwise



3. Oil inside of hose and insert assembly tool



4. Screw swivel nipple or male fitting into socket and remove tool

When hose lines have to be replaced on a drilling rig, it can result in costly downtime. You can save time and cut costs by making up your own hose assemblies in the field with Stratoflex bulk hose and reusable fittings. Just cut the hose to proper length and attach the fitting. The hose assembly is finished and equipment is back at work in minutes.

Stratoflex designs hose lines to conduct oils, gas, gasoline, diesel fuel, anti-freeze, water and air. Assemblies especially suited for offshore use feature stainless steel braid hose and brass or protected plate steel fittings.

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Bristol Bay wildcat . . .

(continued from page 16)

and Great Basins conducted a joint geological and geophysical survey on the lease. The area has yielded sediments similar to those which have proven productive in the first discovery on the Kenai Peninsula.

New Kenai drillers . . . On the Kanai Peninsula, Halbouty Alaska Oil Company has spudded its initial test after the fastest movement of rig and equipment from California to Alaska in the history of Alaskan drilling operations.

The wildcat is a joint venture of Halbouty and King Oil, Inc. with Halbouty as the operator. Located in the Swanson River area, 3½ mi. southwest of Standard-Richfield's No. 2 Swanson River well, the test was spudded just 20 days after the rig was loaded aboard a ship at Long Beach, California.

The Coastal rig is completely winterized for the Kenai Peninsula temperatures which sometimes dip to 10 degrees below zero. Steam pipes run down inside the conductor pipe to prevent the cement from freezing while it sets around the pipe.

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Socal Begins Marine Survey In Waters of Cook Inlet Area

Standard Oil Company of California, Western Operations, Inc., has begun a marine seismic survey of the Cook Inlet area of Alaska.

Four seismic vessels and crews arrived at Homer, Alaska, last month. Standard of California is the operator for a group made up of Continental Oil Company, Shell Oil Company, The Ohio Oil Company, Richfield Oil Corporation, Sunray Mid-Continent Oil Company, The Superior Oil Company, Texas-Alaska, Inc., Union Oil Company of California and Western Gulf Oil Company.

In order to avoid harming marine life, the operator has adopted special precaution including the use of an explosive that is not harmful to fish.

Bahamas

$3 Million Cay Sal Wildcat Drilling Below 17,000 Ft.

A $3 million offshore test is drilling below 17,000 ft. at Cay Sal Banks in the Bahama Islands.

The wildcat, which was spudded a year ago, is a joint venture of Standard Oil Company of California and Gulf Oil Corporation. A giant mobile unit, the **Vinegarroon,** has been doing the drilling in about 30 ft. of water on a 1.9 million sq. mi. lease.

The originally scheduled depth was 15,000 ft.

Borneo

First Mobile Unit by British Begins Long Tow to Borneo

Brunei Shell Petroleum Company, Ltd.'s 5400-ton mobile unit is on its way to Borneo via the Suez Canal.

Exploration in the South China Sea has been shut down for more than six months awaiting the arrival of the rig. The new mobile unit will spud its first well about 40 mi. offshore in an area where four dry holes were drilled from fixed platforms.

Named the **Orient Explorer,** the barge is the first built in England. It was designed by the DeLong Corporation and built by Steel Structures, Ltd. at a cost of $2.8 million. Outfitting the unit brought the total cost to about $5 million.

The **Orient Explorer** is designed to withstand winds up to 100 mph and waves up to 30 ft. high. It will be supported at the drill site by four caissons 235 ft. long. Crew quarters will accommodate 35 men.

California

Pacific Driller No. 1 Damaged By High Waves on Location

The West Coast's first mobile unit has been towed to Long Beach, California, for repairs after giant waves broke off four of its legs.

When the accident occurred, **Pacific Driller No. 1** was preparing to move after completing the first wildcat on a 3840-acre lease obtained last July by the Texaco-Monterey-Newmount group. The mobile unit's caisson legs—six-ft. in diameter—were only a few feet off bottom when the waves struck.

Rincon Drilling Third Well; Two Completions Shut In

Work is progressing on the third well drilled from Richfield Oil Company's Rincon Island off Punta Gorda, California.

Two wells have already been completed from the artificial island which is planned for 68 wells. Both wells are shut in until construction of separating, gauging, and treating facilities on the island is finished.

The first well, drilled to 2648 ft. was plugged back to 2523 ft. The second well was completed at 2720 ft. after being drilled to 3375 ft.

The island which can drill two wells at once is connected to the shore by a 2700-ft. long trestle.

Standard Oil Will Quitclaim 740 Acres Off California

Development will cease for the time being on 740 acres of Standard Oil of California's 960-acre offshore State Lease P. R. C. 735.1 at Montalvo.

Standard has filed a quitclaim on that acreage with the California State Lands Commission. The company will keep 220 acres of the original concession it acquired by competitive sliding scale royalty bidding in 1952.

The lease's 13 wells have been slant drilled from onshore sites. Two of these were unsuccessful and others have produced heavy viscous crude oil.

Cuba

Standard Subsidiary Abandons Drilling Operations in Cuba

Three unsuccessful wildcats have caused Cuban Stanolind Oil Company to abandon drilling operations in Cuba.

The first venture was a 9703-ft. hole, Tortuga Shoals 1, off Las Villas Province. Other wells were northeast of Manzanillo and in the Guacanayabo Bay area.

Dutch Guiana

14 Million Acre Concession Development Plans Are Told

Extensive exploration will begin soon on acreage held by Gulf States Land & Industries Inc. in Surinam, Dutch Guiana.

Development of the 14 million acre lease will be both on land and offshore.

Iraq

Deepwater Terminal Tops $70 Million Expansion Plans

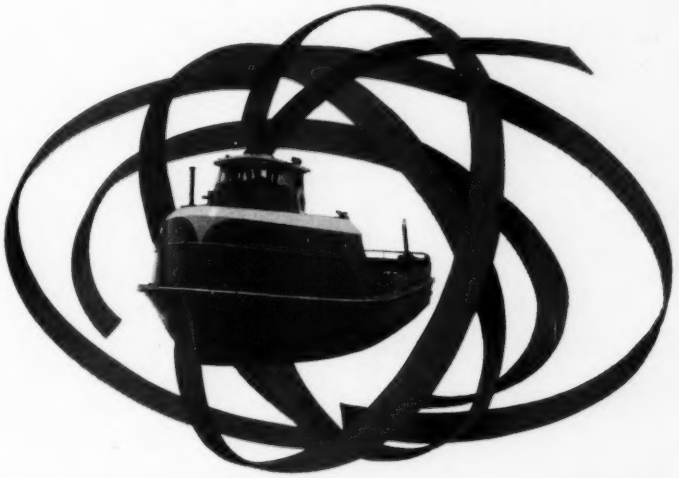
Basrah Petroleum Company, affiliate of Iraq Petroleum, has laid out a $70 million building program to strengthen Iraq's position as an oil exporter in the Persian Gulf.

Much of the program will take place in the Persian Gulf where a deepwater terminal capable of loading 65,000-ton tankers will be constructed 24 mi. offshore and a 30-in.

(continued on next page)

George Engine

takes the red tape out of boat buying and financing



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3. We will see to it that the boat is properly G. M. Diesel powered.
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DIESEL *power by* **George Engine** GM DIESEL POWER

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Deepwater terminal . . .

(continued from preceding page)

to 32-in. crude oil pipeline will be added to the present facility which extends from Rumaila to Zubair.

Not only is the program designed to boost Iraq's export limit to 440,000 bbls. daily, a 200,000-bbl.-per-day increase. It will also place the country in a more competitive position with other leading Mid-East oil nations and will prevent the cutting off of oil should the lines be sabotaged as they were once before.

Builder for the terminal is a three-company group consisting of Raymond International, Ltd., DeLong, Ltd. of London and Richard Costain, Ltd. of London.

The pier, which will consist of five 400-ft. long platforms will be built on steel pilings and will be 1302 ft. long. It will contain living quarters for crews and a heliport for landing of helicopters.

Collins Submarine Pipelines Overseas, Ltd. will lay a 32-in. submarine line to the pier from Fao.

Lake Erie

Operators Claim Criticism Of Equipment Unjustified

A rig collapsing in Lake Erie during a violent storm has provoked criticism from a coroners jury concerning the drilling equipment used by operators in the lake.

Operators say, however, that the criticism is unjustified and they see no reason for changing present designs of their equipment. The ill fated rig on which five lives were lost was owned by Underwater Gas Developers, Ltd., a subsidiary of Consolidated West, Ltd. It was a portable steel structure similar to those used by the company to drill 57 wells in the past two years.

It is supported by four legs and secured by ¾-in. steel cables attached to steel pile points driven into the bottom of the lake. In order that the crew will not have to return to shore each day, living quarters are provided aboard the platform.

At the time of the accident, the rig was drilling off the Ontario shore 14 mi. from Long Point and would have been towed to land within the next 24 hours.

The investigating jury's chief criticisms were that a seaworthy lifeboat was not provided and that the ¾-in. cables were insufficient to withstand the severe wind and wave forces encountered. Two of the cables were found snapped, and a life raft on the platform had not been fully inflated.

Company officials declared, however, that the life raft could hardly be used in a storm anyway, and it believes a ship ramming the platform in the darkness may have severed the cables. The platform was located in a ship channel. Also, one of the body's being only partially clothed indicated the catastrophe occurred suddenly.

The firm's engineers are firmly convinced that their present design is adequate. To prove it, they are replacing the wrecked platform with another of the same style, the only alterations being stronger piling points for attaching the cables. This will be done merely as an added safety factor, they state.

Louisiana

CATC Has Now Restored Burned Out 45-E Platform

CATC's burned out Block 45-E platform off Louisiana is being rebuilt and some of the wells have already been restored to production.

The only well which has been completed so far is the relief well which Kerr-McGee's **Rig 46** drilled and it is a triple completion. The other relief wells may also be completed, with a small permanent platform built for each.

One of the seven wells which were involved in the fire late last year is being reworked. That is E-3, a triple completion.

Netherlands

First Offshore Exploration In Europe to Be off Holland

A drilling barge is being built in Rotterdam, Holland for drilling in the North Sea off Southern Holland.

Plans are to put the rig to work following the first offshore exploration for Europe to be carried out soon by Netherlands Oil Company. Joint owners of the company are Standard Oil Company of New Jersey and Royal Dutch-Shell. Seismic surveys will be conducted off the coast from onshore fields which now produce a quarter of Holland's 30,000 bbls. daily production.

New Zealand

Natural Gas Seep Detected Offshore from New Zealand

Natural gas has been discovered escaping from the seabed near

(continued on page38)

HALLIBURTON PRODUCTION PACKERS

chosen for world's deepest test!

Type "C" Production Packer with Standard Sealing Unit

The deepest test ever made with Production Packers or any other tools was recently completed by Phillips Petroleum Company in Pecos County, Texas.

Phillips chose two Halliburton Type "C" Production Packers for the unique job of successfully isolating, treating and testing a zone from 24,897 ft. to a T. D. of 25,340 ft. in the world's deepest hole.

Halliburton Special Tools Operators running Type "C" Production Packers for the world's deepest test in Phillips Petroleum Company's No. 1-EE University Well, Pecos County, Texas.

This unusual testing and treating technique applied in the world's deepest hole was planned and supervised by Phillips personnel who collectively reviewed hole conditions and expected good performance of the Halliburton Production Packers before packers were run in hole...

The first packer was run and set in 13 hours and 60 seconds. Rate of descent was 30 seconds per 90 ft. stand, in 7⅝ and 7 inch casing to top of liner at 22,682 ft; then 75 seconds to 90 seconds in 5" liner to desired depth.

The second packer was set six feet above first packer. Both packers easily set in normal manner—pipe was rotated to set upper slips; an upward pull on drill pipe expanded packer, set lower slips and sheared tension sleeve freeing drill pipe and double seal units from packer before job began.

The packers were subjected to extremely rigorous conditions through loading and circulating drill pipe to surface, swabbing jobs, pressure testing many times to 10,000 psi and pumping into formation and treating bottom zone near 10,000 psi. Packers were unaffected by bottom hole temperatures of 320°F.

More than 37 Halliburton Production Packers have been successfully used for this purpose in 3 wells in the Pecos County Area alone!

For the most versatile Production Packer available for testing, treating and producing wells under the ruggedest oil field conditions... in only one trip with tubing or drill pipe—be sure you choose Halliburton!

HALLIBURTON SPECIAL TOOLS SERVICES

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IF you're confused by the number of coal tar-epoxy resin coatings on the market today, perhaps these few brief facts will clear the air:

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2. No other coal tar-epoxy resin coating duplicates the exclusive TARSET formula. It has not been made available to anyone else.

3. Only TARSET coal tar-epoxy resin coating is backed by a *five year* record of outstanding performance in the field.

Do *you* have an unusual corrosion problem in the marine, chemical, petroleum, pulp and paper, water and sewage, or general plant maintenance field? Then you should know more about the revolutionary ability of TARSET to stop corrosion where most other practical methods fail. And to do it at relatively low cost. *Call your industrial distributor for more information . . . today!*

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★ PITT CHEM "Insul-Mastic" Gilsonite Coatings
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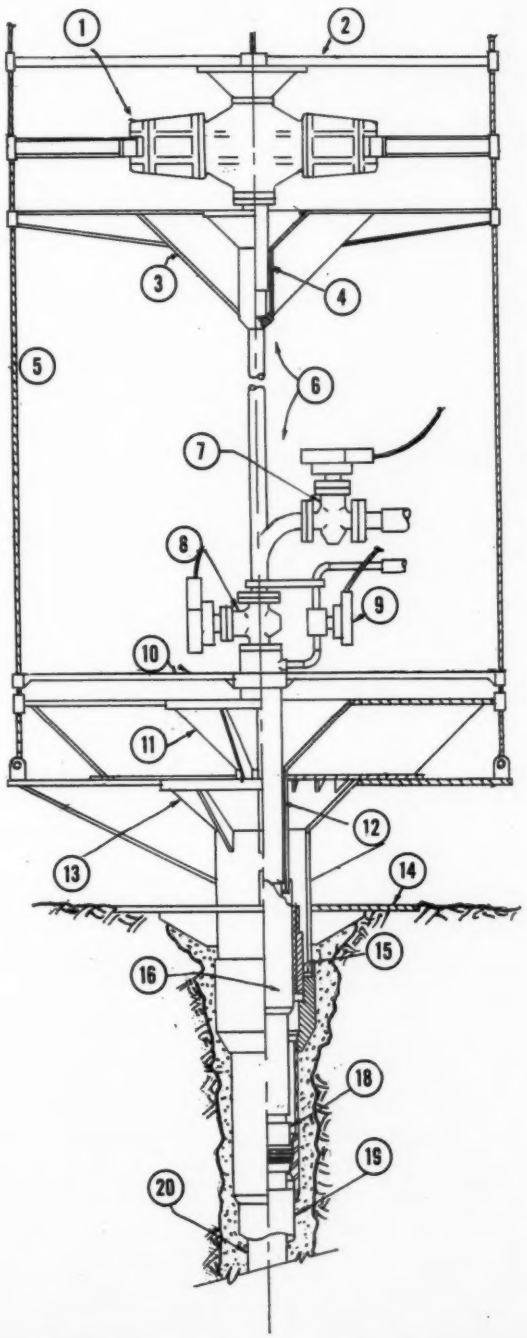
Approach to Underwater Workovers

In Drilling From Floating Vessels

By ALLEN F. RHODES
Vice President of Engineering and Manufacturing,
McEvoy Company; Vice President, Sea-Mole, Inc.



Several types of underwater completions have been described in previous articles; however, there has been no detailed description of the equipment and procedures used in working over wells completed in this manner.

It is apparent that provisions must be made for working over wells completed under water in order for the technique to be of any value in offshore operations.

During 1956 and 1957, for example, one operator found that sand problems in an offshore field required workovers on all the wells drilled during the initial development program. Furthermore, it took the experience of a considerable number of workovers in this field to develop a satisfactory method of preventing the sand troubles from occuring in newly drilled wells.

The main point of difference between working over a well completed under water and one completed at the surface is that of controlled access. This, of course, presents no problem in a surface completion.

If wireline workover tools are to be used, the master valve or crown valve on the Christmas tree is closed, pressure is bled off, and a lubricator is installed. Thereafter, the tools can be loaded into the lubrica-

(continued on next page)

COMPLETING UNDERWATER for easy workover: (1) Unlatch 10¾-in. safety joint with releasing spear and remove BOP assembly. (2) Make up Christmas tree with 10¾-in. safety joint barrel on bottom and 4-in. safety joint mandrel and guide funnel on top. (3) Make connections to flow line, annular access line, and control lines to remote operated valves. Test valve operation. (4) Run in tree and latch in place to 10¾-in. safety joint mandrel. (5) Run in 6-in. control gate and latch to 4-in. safety joint mandrel atop Christmas tree. (6) Retrieve blank tubing plug with wire line tool. Well can now be swabbed; circulation can be established between tubing and casing; or wire line tools can be run in and out of hole for completing.

---

(1) 6-in. API series 1500 hydraulic control gate (2) Wire line tool guide (3) Guide funnel (4) 4½-in. safety joint (5) Guide cable (6) Christmas tree (7) Remote operated wing valve (8) Remote operated master valve (9) Remote operated annular access valve (10) Christmas tree guide (11) Upper guide funnel (12) 10¾-in. safety joint (13) Lower guide funnel (14) Landing base (15) 13⅜-in. safety joint mandrel (16) Upper casinghead body (18) 10¾-in. casing hanger (19) 13⅜-in. O.D. casing (20) 10¾-in. O.D. casing.

Underwater Workovers . . .

(continued from preceding page)

tor as desired and remedial operations conducted in a conventional manner.

In addition, down hole plugs, such as the latch-in type McEvoy-Otis back pressure valve, can be installed to permit removal of the Christmas tree or its components with the well under pressure.

Also, if the remedial work involves removal of the tubing, the well can be killed with drilling mud or other fluid. The Christmas tree can then be removed and blowout preventers installed, after which any type of conventional work can be performed on the well, including bailing sand, deepening the hole, repairing leaks, removing casing, and plugging back.

Properly designed, underwater completion equipment can also provide for all these operations. On the underwater wellhead shown in the illustrations, workover operations are carried out from a floating vessel or mobile drilling unit. This equipment was developed by McEvoy Company in conjunction with Sea-Mole, Inc., which has a complete method for floating drilling and underwater completion.

As can be seen in **Figure 1,** an extension above the remote operated master valve provides space for wireline tools to be installed as does a lubricator on surface equipment. At the top of this tube is a funnel and small remote connection.

A blank is used as the upper portion of the remote connection during normal production operations. This blank portion of the connection seals off the upper end of the tube and has a remote releasing cable. This cable and the two guide cables are connected to a buoy or other marking device after the well has been completed and the drilling unit is ready to move off location. Alternate control lines to the remote operated valves will also be connected to the marker.

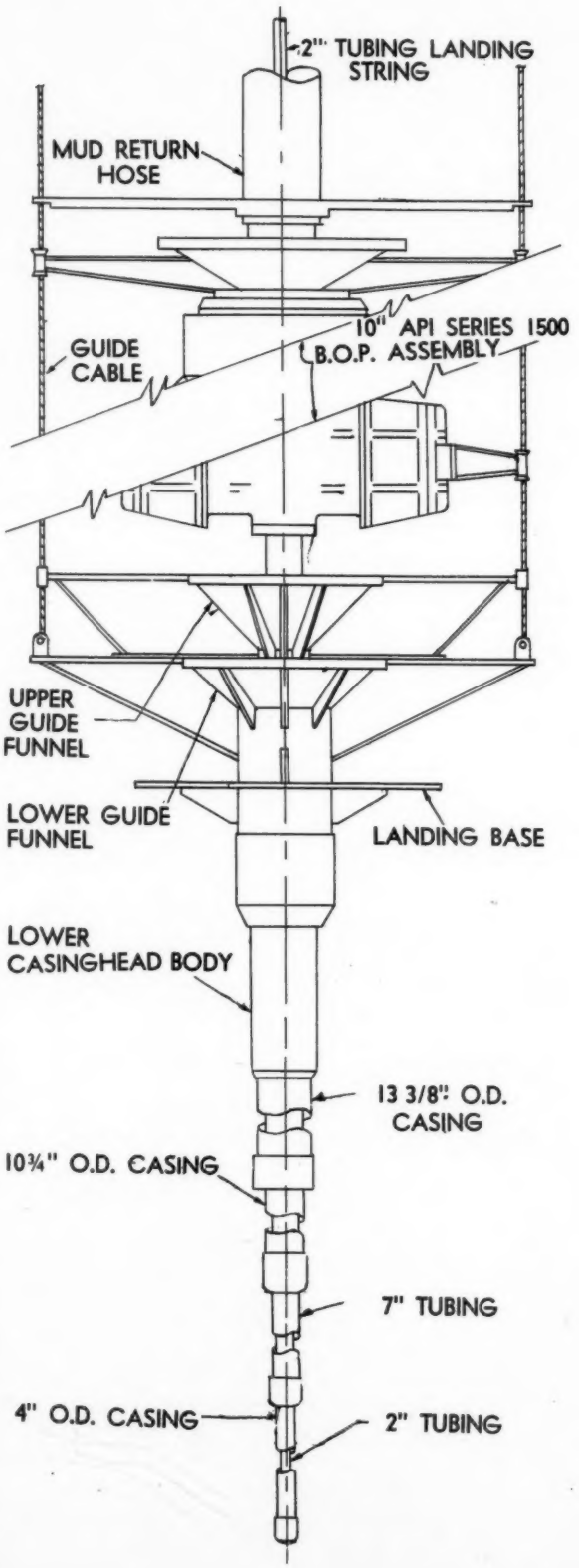
With this arrangement, the well produces into a flow line which is laid on the ocean bottom and leads to a tank battery or other production facility. Valve control cables and a small annular access line (connected to the tubing casing annulus to show any pressure build-up) will probably be laid on the bottom to the tank battery along with the flow line.

The Christmas tree rests on the bottom with guide cables and other lines connected to a marker buoy. When the well is to be worked over, the workover unit is moved on location, using the marker buoy as a guide.

The guide lines, together with the remote connection release cable, are retrieved from their attachments to the buoy. The guide lines are connected

(continued on page 28)

DRILLING AND SETTING casing in remainder of hole: (1) Run in 7-in. casing and land hanger in seat provided in upper casinghead body. (2) Cement 7-in. casing, using circulating tool or annular access lines to obtain circulation through casing. (3) Drill 6⅛-in. hole to total depth. (4) Run in 4½-in. casing and land hanger in its seat. (5) Cement 4¼-in. casing, using circulating tool or annular access lines for circulation. (6) Run in 2-in. tubing with packer on bottom and hanger on top. (7) Remove handling string and set blank plug in tubing.



How oil and gas are trapped around the saline monoliths that tower beneath our feet . . .

The Evolution Of Salt Domes

PART II

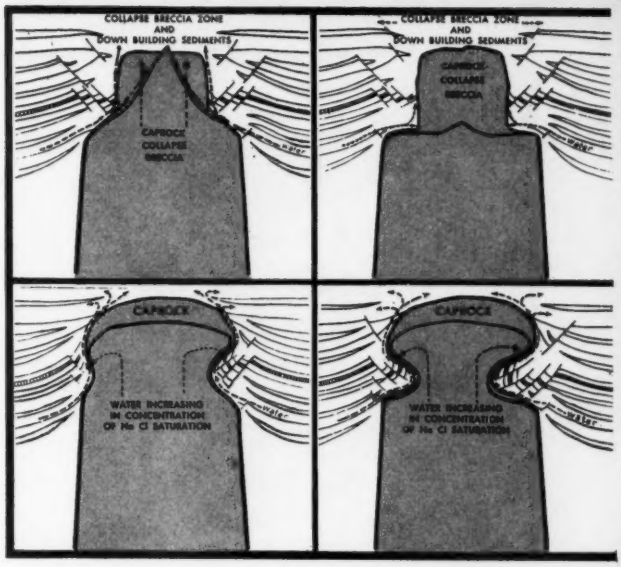
We have seen how salt domes form as a result of the ever-growing weight of sedimentary deposits on deep-seated, ancient salt-bed deposits. The mother salt for the domes beneath Texas, Louisiana, Mississippi, Alabama, northwestern Florida and the adjacent Gulf is called Louann Salt, and is thought to be a more or less continuous bed, deposited in a great salt basin 150 to 200 million years ago.

Ocean water contains about 3.5 percent salt. As it evaporates in basins only slightly connected with the main water body, mineral content concentrates. First to crystallize is calcium carbonate, or limestone. Then calcium sulphate, or anhydrite. Third, halite or rock salt, and last to crystallize are several minerals such as those from which potash fertilizer is made. This was the general evaporation cycle when the Louann Salt was deposited. Its thickness is not known except at the basin's margin. But it may have been as thick as 5,000 feet over much of the basin before its started oozing up.

Dome distribution . . . Of all the areas underlain by rock salt in the U.S., only two are known to contain salt domes. One is the Gulf Coast area and the other is the Paradox Basin in southeastern Utah and western Colorado. The character of the Paradox Basin domes and their development history isn't too well known. As for the Gulf Coast, much of our present data results from the thousands of wells drilled around and into the domes in prospecting for oil, gas and sulphur. Additionally, several salt mines are currently producing the salt itself from the top of some of the domes. Prospecting in other salt dome areas of the world, such as Germany and Denmark, is limited compared to that along the Gulf Coast.

Detecting domes . . . Domes known today have been detected by various methods. Initially, through surface geology, they were identified by mounds (like the one at High Island near Houston), lakes, paraffin beds and, in one case, rock salt. When the first wells were drilled, subsurface geology proved an important tool. In the late '20s the torsion balance and seismograph were added as finding tools. The torsion balance, originally a pendulum, has found salt domes because rock salt weighs less per cubic foot than hard rocks. The seismograph found salt due to the difference in the velocity of sound passing through salt and rocks.

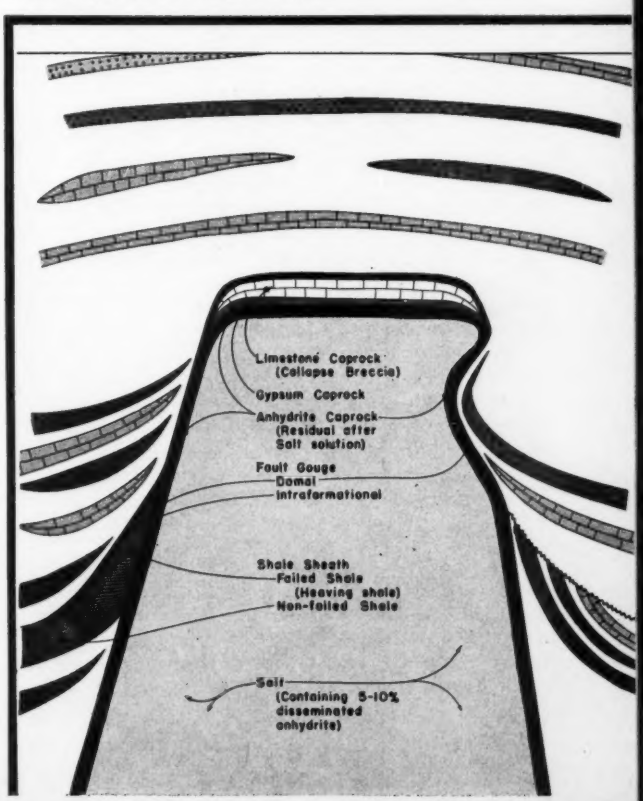
Condensed from an article entitled "Salt of the Earth" which appeared in the GULF OILMANAC. Illustrations courtesy of Gulf Oil Corporation.

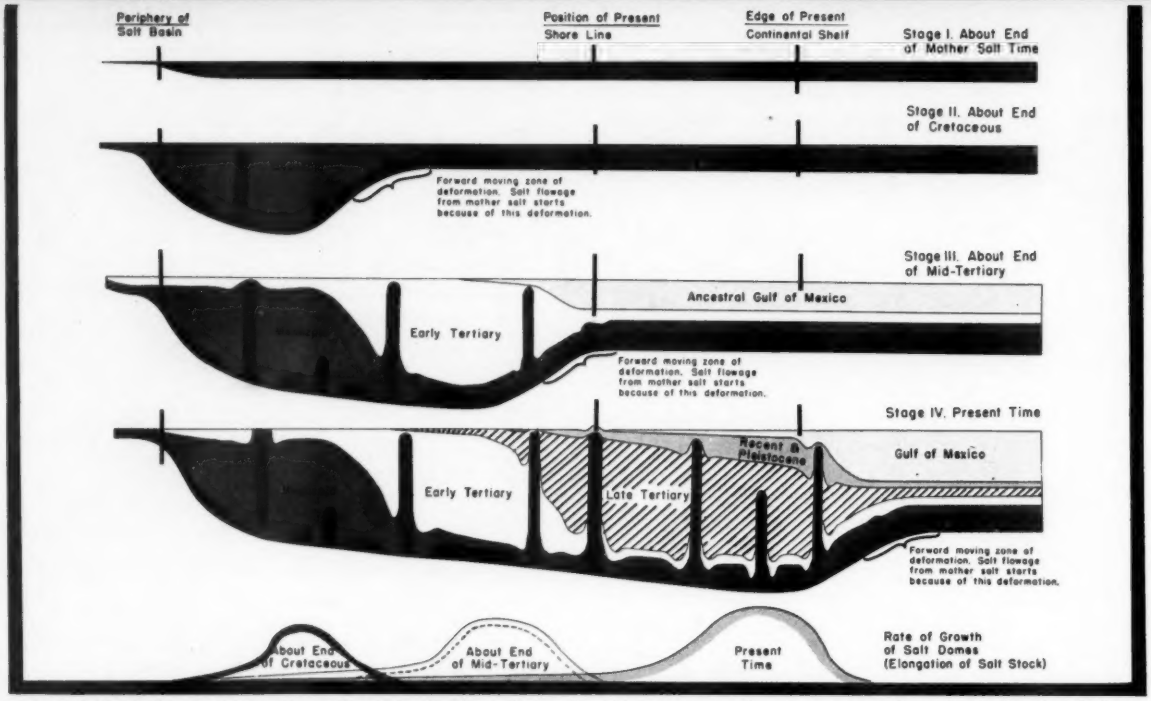

COLLAPSE BRECCIA ZONE AND DOWN BUILDING SEDIMENTS
CAPROCK COLLAPSE BRECCIA
CAPROCK
WATER INCREASING IN CONCENTRATION OF Na Cl SATURATION

Underground water flowing under artesian pressure against domes' flanks and caps can effect a wide variety or cross sections by dissolving salt. Above, four profile possibilities out of many known.

Effect of underground water . . . Underground water dissolves salt domes. Most people are aware how water moving underground through porous formations has created such cavities as Mammoth Cave and Carlsbad Caverns. In the Gulf Coast area the formations slope deeper and deeper as they near the Gulf. Beds exposed at Dallas, for instance, are probably submerged 30,000 feet at the coast line. Water in these sloping beds is under artesian pressure, and will flow upward around a salt dome if an escape route is available. The results

Below, nineteen possible oil and gas reservoir structures are schematically shown. Consisting mainly of sand and limestone formations, these traps are formed by the combined action of the upthrusting dome and underground water erosion that causes the strata to collapse, fault, fracture or otherwise shift and change character, forming these oil and gas traps.




Periphery of Salt Basin
Position of Present Shore Line
Edge of Present Continental Shelf
Stage I. About End of Mother Salt Time
Stage II. About End of Cretaceous
Forward moving zone of deformation. Salt flowage from mother salt starts because of this deformation.
Stage III. About End of Mid-Tertiary
Ancestral Gulf of Mexico
Early Tertiary
Forward moving zone of deformation. Salt flowage from mother salt starts because of this deformation.
Stage IV. Present Time
Recent & Pleistocene
Gulf of Mexico
Early Tertiary
Late Tertiary
Forward moving zone of deformation. Salt flowage from mother salt starts because of this deformation.
About End of Cretaceous
About End of Mid-Tertiary
Present Time
Rate of Growth of Salt Domes (Elongation of Salt Stock)

Rise of Gulf Coast domes through geologic time shows in this cross sectional account (top to bottom) of four stages in deposition of sediments atop mother salt bed by rivers, streams and prehistoric seas. Domes were supposedly triggered by difference in static load of sediments at, and ahead of, acres of deposition.

of such upward migration of water is visible in the shallow lakes that mark the tops of some domes. As the salt is dissolved, cavities are formed atop a dome, and eventually its roof of sediment and caprock collapses into these cavities. Weight compresses the anhydrite sands atop the salt into rock anhydrite, which on shallow domes not below 2,000 feet often changes to gypsum as underground water reaches it.

As the cycle of dissolving, collapse and formation of rock anhydrite reoccurs, thick sections form. If gypsum caprock has formed, it may continue to change into limestone caprock, and both these substances develop cavities, thanks to the cyclical dissolving of salt and collapse of caprock. On some domes—Spindletop, for instance—this cavernous limestone caprock contains the oil. Or there may be quite large deposits of sulphur.

When the flow of water runs upward along the side of the dome, the erosive action of the water washes salt out of the side of the dome, causing a change in domal shape whereby the top of the dome forms an overhang in somewhat of a mushroom shape. One such dome, the Barber's Hill, was the first around which extensive production was found under a salt overhang.

Domes growing . . . Keep in mind how slowly nature works, imagine the Gulf Coast basin of deposition gradually filling — as it is — with sedimentary materials carried by the streams entering the Gulf from the north and west. If this sedimentary depositing continues long enough, the Gulf will be filled. A zone of deformation, which, simply stated, is sort of a doughnut area in the mother salt bed formed by increasing weight of ever-new sediment deposited along the Gulf's outer edge, underlays the deepest, central ocean floor of the Gulf. The newest domes forming offshore under this oceanic floor are oozing their way upward from this deformation zone as the weight of river-deposited sediments increases over and around them. Since domes form as the strata is deposited, their tops are never far below, and are sometimes above, the surface of the sediments . . . the depth depends on their relative rate of growth of sediments to the rate of deposition of sediments. But because domal growth tends to slow down as the domes run out of mother salt or as friction becomes too great, some of them have been buried by sediments deposited at a rate that outraces that of the domes' growth in old age.

Oil and gas traps . . . Remember there was no dramatic upshooting of salt domes through stratification already in place . . . rather, the domes rose as the sediments settled about them, weighing down their mother salt and causing them to rise. And there was ample sediment . . . strata on the continental shelf have an estimated thickness of about 40,000 feet. This brings us to how salt domes form oil and gas traps.

The effect of that inexorably rising salt on the strata through which it's passing is the formation of these traps. As salt leaves the mother bed to feed the dome in its ascent, the strata around the dome downwarp—their salt formation is oozing out from under them. Their edges next to the salt are bent upward by the rising column. Oil and gas migrate to these upturned beds around and over the dome. These lateral strata fracture, with some sections moving further than others. The arrangement of these fractures, or faults, about the dome can be exceedingly complex. A cross-sectional diagram (see cut) shows nineteen possible oil-trap structures found about salt domes, and these can be modified by the complex faulting and deformation mentioned, or by other subterranean alterations.

Offshore prospect . . . Geologically, onshore and offshore salt domes are basically alike. Economically, they differ drastically due to exploration and production costs. The shallower parts of the more coastward onshore domes have been extensively tested. Deeper reservoirs will doubtlessly be found, but probably not in the numbers of these known at lesser depths, since more snale and less sand confronts the deep driller.

Much has been learned about salt domes in the Gulf Coast since oil was discovered in the caprock of Spindletop in 1901. Much remains to be learned. Prospecting of offshore domes has just started, and here cost of producing a barrel of oil will determine the future.

This is the second part of a 2-part article. Part 1 appeared in the February, 1959 OFFSHORE.

Thermal recovery

In Situ Combustion Successful

Fire flood recovers 50 percent of oil in place in just 18 months. Normal production methods would require 40 to 60 years to recover 10 to 15 percent of oil in place

Thermal recovery techniques hold tremendous promise in the recovery of so-called "unrecoverable" oil *(See Offshore, Nov. 1958, p. 31)*.

This fact has been dramatically demonstrated by a three-year thermal recovery experiment conducted by General Petroleum Corporation. Cost of the project was several times the value of oil produced, but a spectacular result was that four production wells reached some 15 times their total rate before ignition, for a time.

And overall cost was higher than might be expected in a commercial application.

General Petroleum was operator for the more than $1 million experiment, with 11 other companies participating. The method used—passing a combustion front through the oil zone—was based on pioneer work by Magnolia Petroleum Company.

Results . . . Within 18 months after ignition, about 50 percent of the oil initially in place was produced. With normal methods of production, a recovery of 10-15 percent of the oil in place could be expected in 40-60 years.

Conditions . . . The test pattern was only half the normal 5-acre spacing (in California's South Belridge field). The 2½ acre test pattern included four equally spaced production wells surrounding one centrally located injection well.

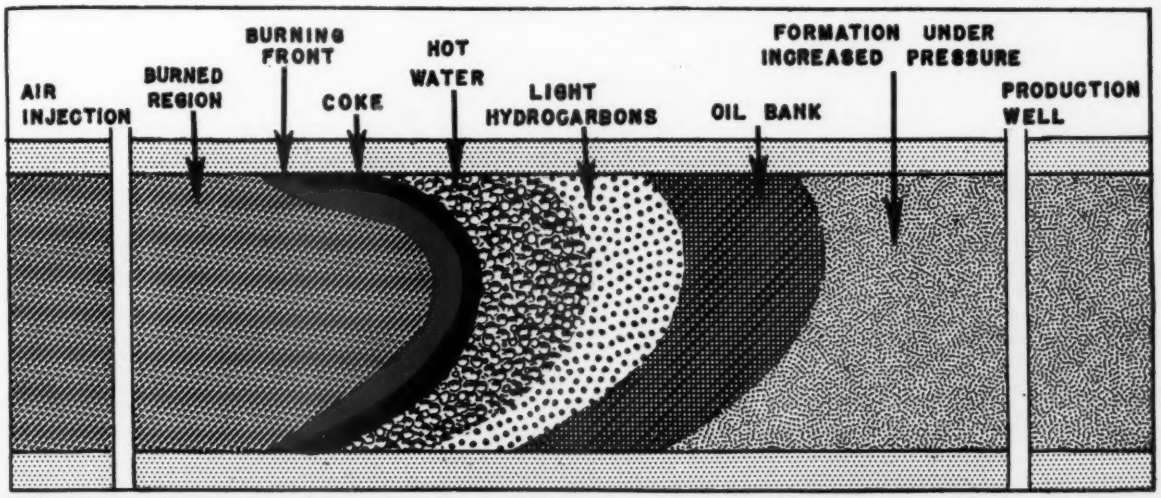
The method . . . On March 1, 1956, injection of 100° F air was started. Three compressors were used with a rated capacity of 3.5 million cu. ft. daily at a maximum of 500 psi. On June 15, ignition started.

From a conservation viewpoint, only a small fraction of the otherwise unrecoverable crude oil is consumed as fuel in the process. Bulk of the fuel is coke and heavy residuum. The lighter, usable oil is pushed ahead of the burning front *(see drawing)* after its viscosity has been reduced both by temperature and removal of the heavy ends.

Recovery . . . Total oil rate was 20 bpd before ignition. Oil rates began to rise rapidly two weeks after ignition. Frequent well stimulation work was necessary to maintain rates. As the combustion front approached the production wells, the water cut increased and water and oil emulsion became a serious problem.

Combustion front . . . The combustion front reached two of the producers about three months after ignition, but corrosive conditions and high temperatures made well maintenance difficult and costly. To continue production, it was necessary to drill replacement wells. The oil rate then reached its maximum level of 300 bpd for a short while.

High cost . . . Higher costs included drilling four observation wells and three core holes. Greatest items of cost were drilling, repairing, re-drilling, abandoning and replacing producing wells, and the cost of the air compressors and their operation.



FIRE FLOOD—Cross section of thermal recovery method used in experiment conducted by General Petroleum Corporation in California's South Belridge field.

Underwater Workovers . . .

(contined from page 24)

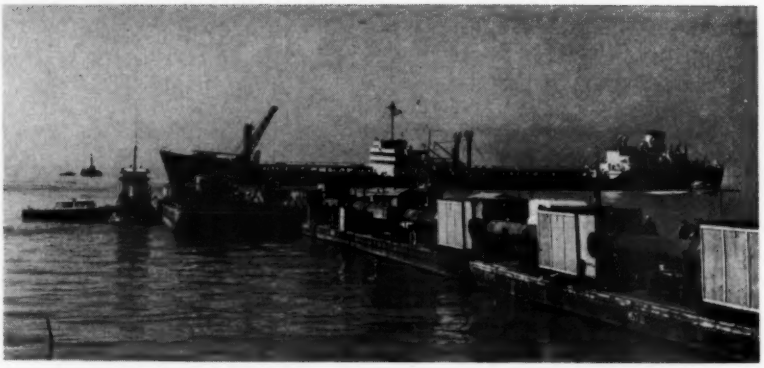
to be held in tension and used to help center the workover unit over the hole. The master valve is closed by remote means, and pressure in the Christmas tree and flow line is bled off through the flow line at the production facility. With pressure relieved, the upper half of the remote connection can be removed, using the releasing cable and a removal tool.

A hydraulic operated control gate is then lowered down the guide cables and attached to the upper end of the Christmas tree with the remote connection. Control gate has two sets of rams, one set being blank and the other sized to seal around the wire line used to support workover tools in the hole. The desired tool is lowered through the control gate into the tubular extension above the master valve. The cable rams are closed on the control gate, together with the wing valve of the Christmas tree. The master valve is then opened, providing controlled access for the tool inside the pressurized tubing bore.

The combination of the Christmas tree valves and control gate, all remotely operated, therefore, provides access required. Wireline tools can be introduced, manipulated, and removed from the hole as desired. If it is necessary to remove the Christmas tree, a latch-in sealing plug can be installed inside the tubing and the tree can be removed, using a wireline operated retrieving tool which disengages the connection labeled "10¾" safety joint" in **Figure 2.**

It is felt that development of satisfactory underwater completion techniques will ultimately require this type equipment. No method or procedure can be considered suitable until it provides for all types of workover and abandonment operations with safety and ease.

It should be pointed out, however, that there are other design considerations in an underwater completion which are of equal importance with the workover features. The entire procedure of drilling, completion, workover, and abandonment must be considered and analyzed to achieve the balance in design required for this new drilling and completion equipment.



LOADED TANKER crosses between the lay barge and the spud barge on the west bank of the channel. Normal operations of ship traffic were not hampered during the pipeline crossing.

Traffic problem licked in . . .

Ship Channel Crossing

An 11-mi. submarine pipeline is laid up side of channel, then pulled across by a pulling unit on a spud barge

Laying a submarine pipeline across the ship channel of one of the country's busiest ports calls for some real maneuvering to keep from interfering with marine traffic.

Brown and Root, Inc. recently laid 11 mi. of 24-in. concrete-coated line from near San Leon across Galveston Bay to Smith Point for Coastal Transmission Corporation.

Four lay barges were trained together to handle the pipe. The barges were equipped with 10 working stations, six welding stations, one X-ray station, one clean and prime station, one dope station and one field mold station. Total length of the four lay barges was 460 ft.

To facilitate the crossing without hindering traffic through the ship channel, Brown and Root pipeliners laid the pipe up the west side of the channel where the pipe was cut. The lay barges were then towed across the channel and spudded in. A spud barge with a pulling unit was placed on the west bank of the channel and the pipe string was pulled across.

Pontoons were strapped onto the pipe string at intervals to decrease the negative buoyancy of the pipe, enabling the spud barge to pull the heavy pipe string across.

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New method for

Converting Chemical Energy Into *Electrical* Power

A revolutionary "fuel cell" may power autos, aeroplanes and spaceships, can be 30 times more efficient than the ordinary storage battery

Imagine, if you can, aeroplanes and even spaceships powered by electrical current.

Lockheed scientists believe it can be done. A new method for converting chemical energy directly into electrical power is an advanced development at Lockheed Missile Systems division laboratories.

The "fuel cell" on which Lockheed scientists are working is related to the ordinary automobile storage battery, and has attained unprecedented efficiencies in electro-chemical conversion. It could revolutionize conventional propulsion systems.

Dr. Morris Eisenberg, who is directing work on the fuel cells, has repeatedly achieved in laboratory experiments almost 100 percent of fuel utilization and energy conversion efficiencies of 70 percent or better, according to a Lockheed spokesman.

This compares with a steam engine which has a conversion efficiency of 35 percent and an internal combustion engine which is even less efficient.

Eisenberg predicted that a fuel cell which would yield sufficient energy for powering an auto or even a plane could be developed within five years. He said other possible applications, both scientific and commercial, include providing power sources for:

1) Communications systems and other internal equipment in a spacecraft requiring a long-lasting power supply.

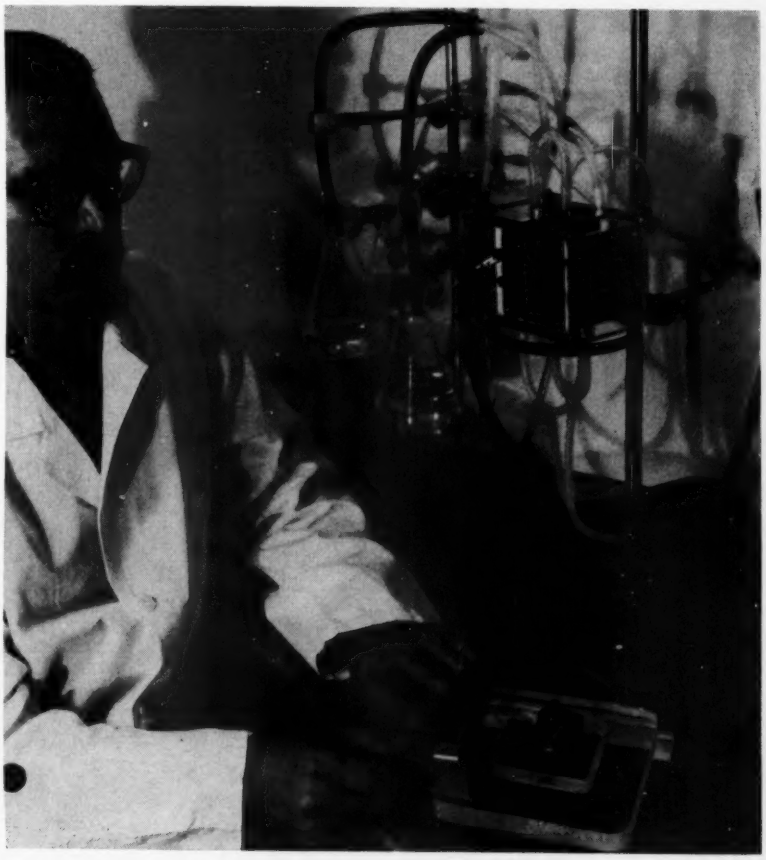
2) Operation of scanning and recording equipment in such scientific space projects as lunar probes.

3) Electrification of rural areas and remotely located communication stations.

4) Operation of industrial machinery, both stationary and mobile.

Comparing the fuel cell with the lead acid battery, Eisenberg explained that the basic difference is that in the battery the active materials are inside the case. In the fuel cell, the

(Continued on next page)



Dr. Ross A. Quinn, Lockheed scientist, demonstrates how a fuel cell converts energy directly into electrical energy to power motor which spins plastic disc. Dr. Morris Eisenberg, head of Lockheed's electrochemical laboratory, has predicted that a fuel cell powerful enough to power autos and even planes can be developed within five years.

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Fuel Cell . . .

(Continued from page 29)

electrochemical fuel is stored outside so the components of the cell are not consumed in the electrode reactions.

Energy produced by electrochemical reaction is measured in watt hours per pound of total weight. An automobile battery, for instance, yields between 8 and 10-watt-hours per pound.

By way of contrast, Eisenberg said, a fuel cell presently being developed is designed to produce 100 watt-hours per pound. He predicted that one of 300 watt-hours could be developed within five years.

"Even a 150-watt per pound cell would produce enough energy to power every type of aircraft or spacecraft and to provide power for communications in satellites and space vehicles," he declared.

As to the possibility of the fuel cell replacing the internal combustion engine in automobiles ,Eisenberg said it would take only an 80-watt-hour-per-second cell to excite Detraoit's automotive engineers and designers.

Major advantages of the fuel cell, according to Eisenberg, include long operating life, adaptability to both large and small-scale applications, on noise or fumes, and ease of maintenance since there are no moving parts.

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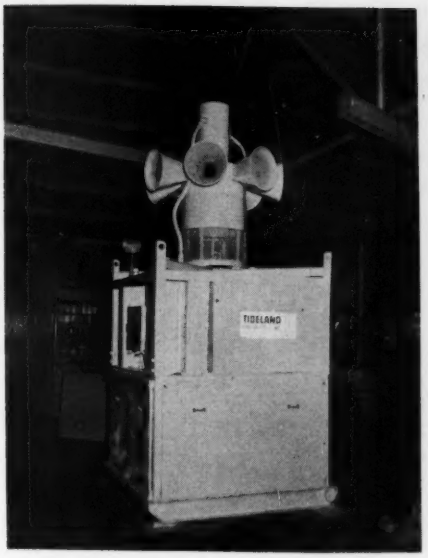
Siren-Type Fog Signal Developed

Unit achieves greatest sound output for the smallest power input ever recorded for a fog signal



Greatest sound output for smallest power input ever recorded for a fog signal has been achieved in a new siren-type fog signal developed by Tideland Specialty Company of Houston.

Unit develops greater sound output than conventional air-horn signals, and offers substantial savings in operating and transportation costs, while occupying less deck space.

Development of the DS-2 Siren-Type Fog Signal comes as a result of solution of several problems involved in use of sirens as fog signals, chiefly the problem of producing a sound of constant pitch.

The siren has long been known as one of the most efficient sound-producing devices available, but characteristic siren noise is a wailing note of varying pitch. Siren sound in the Tideland DS-2 is produced by rotating one ported member (rotor) wthin a similarly ported stationary member (stator). The rotor combines the function of rotary pump and chopper. Alternate cutting and releasing of air flow produces sound waves. Pitch is a factor of the number of port openings and rpm at which rotor is driven.

Pitch . . . Problem of a constant pitch was solved by use of an hydraulic cylinder to periodically lift the 7-ported rotor spinning at 2800 rpm from the "dead chamber" (stator well) into the 7-ported chamber (stator). This immediately produces a note of constant pitch, 325 cycles per second and maximum sound output of 125 decibels, or an audibility range well in excess of two miles. At the end of the period (two seconds) rotor is lowered into stator well and sound is stopped.

Requirements . . . The U.S. Coast Guard requires that a fog signal be satisfactory in tone, characteristics, and geographic range. Sound signal produced must have maximum intensity at a frequency range above 100 cycles and a loudness level of 55

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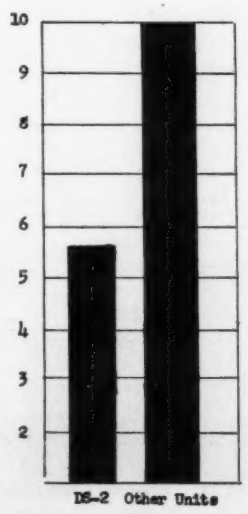

FIGURE 1—Fuel consumption, gallons per day.

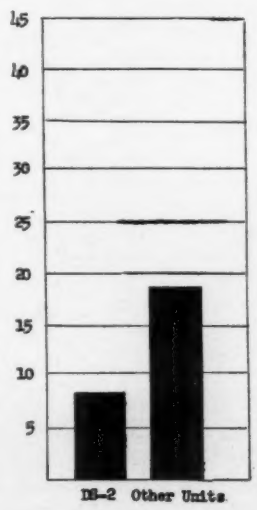

FIGURE 2—Horsepower requirements.

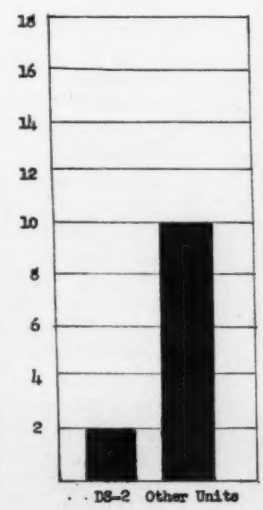

FIGURE 3—Lube oil requirements, gallons per oil change.

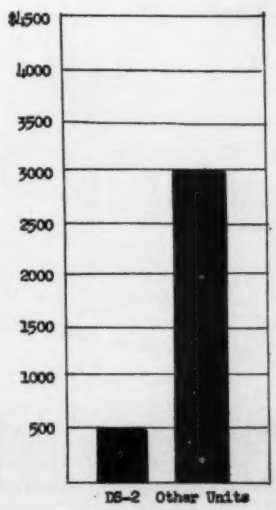

FIGURE 4—Transportation costs.

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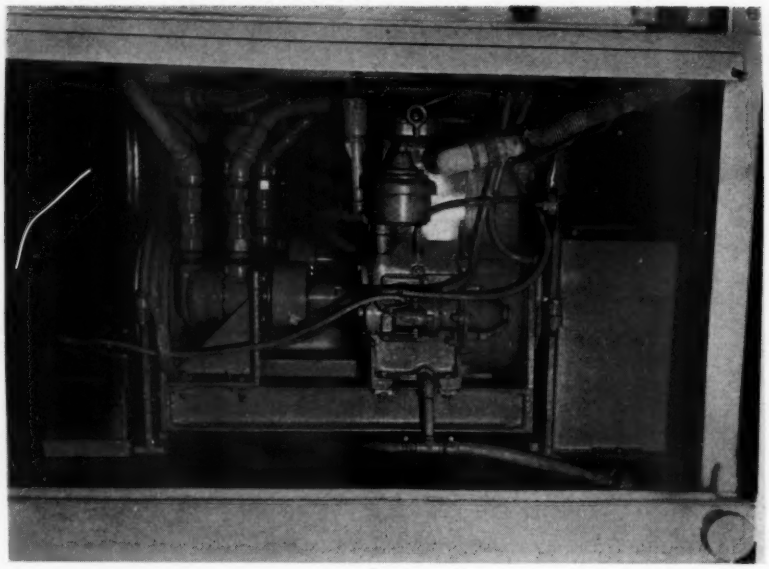


Prime movers are these American MARC diesels, rated at 6.5 shaft bhp. Only one engine is used. The other is a standby.

phons at geographic ranges specified in USCG curves.

DS-2 test . . . USCG curves require a minimum of 116 decibels at 325 cycles. Test of the DS-2 indicated a sound output of 124 decibels at 10 feet, at a frequency of 305 cycles at 2610 rpm. Further, a frequency analysis showed no important harmonics. Tests at actual operating speed of 2800 rpm showed 125 decibels at 25 feet—9 decibels in excess of requirements.

Figure 5 compares fundamental **sound output** of the DS-2 and regular air horns. A difference of approximately 3 decibels is noted. The DS-2 shows a nearly pure fundamental tone, while tests indicate a high harmonic content in air horns. Fundamental **tone output** of the DS-2 is 7 decibels greater.

Components . . . Basic components of the DS-2 system include two American MARC diesels for prime movers. Engines are rated 6.5 shaft bhp and set at 1800 rpm. Only one engine is used. In the event of engine failure, the standby is automatically started and continues the operation.

A Denison hydraulic pump, driven by the engine, operates a Denison hydraulic motor that turns the rotor. Rotor is moved axially upward by means of an hydraulic cylinder. During periods of sound output ports in stator and rotor are aligned. During periods of silence rotor is retracted into stator well.

Economy . . . The complete unit requires only 28 square feet of deck space. Total weight without fuel is 3700 lbs. Total weight with fuel for 45 days continuous operation, hydraulic fluid and lube oil is 7087 lbs.

Tideland engineered the DS-2 to permit transportation of the disassembled unit on a regular crewboat and reassembly on the platform, at approximately 22 percent of transportation costs of standard air units. It is anticipated normal maintenance will be reduced as much as 60 percent by elimination of air compressors, many safety switches, complicated air control systems, etc.

Figures 1 through **4** indicate comparative economy of DS-2 and standard air horn signals.

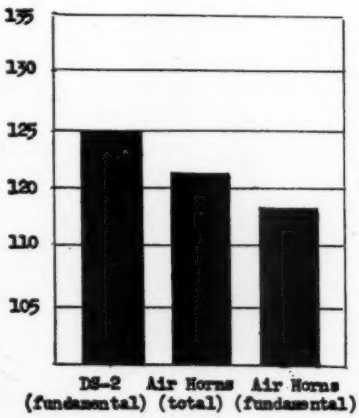
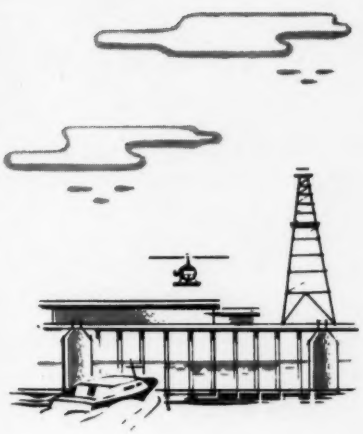


FIGURE 5—Decibels (measured at 25 feet).

Mobile Units, Tenders, And Self-Contained Platforms Gulf Coast Area

OWNER	NAME	WATER DEPTH	PRESENT STATUS
Barnwell Offshore, Inc. Self-elevating 176′ x 176′ x 152′ with three 145′ legs	"Mister Cap"	to 100′	Drilling for Sinclair-Sohio, Block 56, Vermilion Area
Blue Water Drilling Corp. Submersible	Rig No. 1	70′	Drilling for Shell Oil Co., Block 128, Eugene Island Area
The California Company Submersible 11′ x 90′ x 156′ with four 3′ x 10′ x 35′ pontoons	S-45		Bay Marchard, Louisiana, Rowan Drilling Co.
The California Company Submersible 12′ x 90′ x 190′, with four 4′ x 24′ x 50′ pontoons	S-55		Bay Marchard, Louisiana, Noble Drilling Co.
Coastal-Marine Drilling and Construction Corp. Submersible	Coastal Mariner No. 2		Completed well in Carancahura Bay. Now idle
Continental Marine Exploration Co. Submersible 230′ x 99′ with 54′ between fixed hulls	"M & H Drilling Platform No. 12"	To 30′	Test location State Tract 128A
Coral Drilling Company Submersible 180′ x 151′ x 84′ with four pontoons	"Mr. Arthur"	to 70′	Bay Marchand, California Co.
Deepwater Exploration Co. Self-elevating overall 121′ x 118	"Deepwater No. 2"		Completely salvaged unit at LeTourneau, Vicksburg yard
Delta Marine Drilling Co. Submersible	"Chris Zeppa"	To 35′	Drilling for Gulf Oil Corp. State Lease "PP" 192, West Delta Area
Dixilyn Drilling Corp. Self-elevating 194′ x 152′ overall. Three 175′ legs	"Julie Ann"	To 105′	Drilling for Shell Oil Co., Block 163, Vermilion Area
C. G. Glasscock Drilling Co. Self-elevating Deck 258′ x 104′, pad 200′ x 180′ with four 10′ dia. columns	"Mr. Gus II"	45′	Drilling for CATC West Lelta, Block 69
Gulf Marine Drilling, Inc. Submersible	Rig No. 1	22′	Drilling for Gulf Oil Corp. Block 24, West Delta, Well No. 1
Kerr-McGee Oil Ind., Inc. Submersible 13′ x 54′ x 160′ with two 13′ x 14′ x 110′ pontoons	Rig 40	to 22′	Drilling for Gulf Oil Corp., Vermilion Bay
Kerr-McGee Oil Ind., Inc. Submersible 13½′ x 72′ x 140′ with two 13½′ x 13½′ x 140′ pontoons	Rig 44	To 40′	Drilling for self et al, Block 28, Ship Shoal Area
Kerr-McGee Oil Ind., Inc. Submersible 142′ x 69′ x 13′6″, with two 10′ x 11′ x 146′ pontoons	Rig 45	To 35′	Moving to Key West, Fla., for Gulf Oil Corp.
Kerr-McGee Oil Ind., Inc. Submersible	Rig 46	To 70′	Drilling for Gulf Oil Corp., Block 21, South Timbalier Area
Kerr-McGee Oil Ind., Inc. Submersible	Rig 47	To 70′	Drilling for Standard Oil Co. of Texas. High Island area
Louisiana-Delta Offshore Corp. Submersible 180′ x 151′ x 12′	Drill Barge Louisiana	To 65′	Drilling for Shell Oil Co.

LOSS PREVENTION



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Louisiana-Delta Offshore Corp. Submersible 156' x 90'	Drill Barge Delta	To 25'	Drilling for Humble Oil & Refining Co., Block 25 Field, West Delta Area
Magnolia Petroleum Co. (Drill barge on piling)	Rig 52		Drilling in Cote Blanche Bay, St. Mary Parish
Movible Offsore Co. Submersible 200' x 146' x 67'	Movible No. 3	To 45'	Drilling for John W. Mecom, Block 45, West Cameron Area
Movible Offshore Co. Robert Macy Design 201' x 211' x 110'	"Movible No. 2"	To 80'	Drilling for John W. Mecom, West Cameron Area
Noble Barge Co. Twin-hull submersible 217' x 100'	"Lloyd Noble S-66"	To 100'	Being built at Avondale Marine Ways
Ocean Drilling & Exploration Company Submersible 200' x 300' x 98'	"El Dorado"	To 70'	Drilling for CIMA, Gulf of Campeche, Mexico
Ocean Drilling & Exploration Company Submersible 132' x 220' x 58'	"Mr. Charlie"	40'	Drilling for self, Block 90, Eugene Island Area
Ocean Drilling & Exploration Company Submersible 120' x 180' x 49'	"John Hayward"	30'	Drilling for California Co., Block 93, Eugene Island Area
Ocean Drilling & Exploration Company Submersible 200' x 300' x 93'	"Margaret"	To 60'	Drilling for Shell, Block 27, South Pass Area
Ocean Drilling & Exploration Company Submersible 120' x 180' x 50'	"St. Louis"		Drilling for Shell Oil Co., Block 27, South Pass Area
The Offshore Company Self-elevating 8½' x 70' x 203' with twelve 6' dia. caissons	Mobile Unit No. 51		Bayou Bouef, Louisiana
The Offshore Company Self-elevating 13½' x 117' x 220' with fourteen 6' dia. caissons	Mobile Unit No. 52		Drilling for Magnolia Petroleum, Ship Shoal Block 119
The Offshore Company Submersible 12' x 74' x 200' with four 6' dia. caissons	Mobile Unit No. 53		Drilling for Pure Oil Co. Block 20, S. Timbalier Area
The Offshore Company Self-elevating 200' x 104' x 15' with eight 12' dia. towers	Mobile Unit No. 54		Drilling for Texaco and Pan Am., Eugene Island Block 209
The Offshore Company Self-elevating 200' x 104' x 15' with eight 12' dia. towers	Mobile Unit No. 55		Drilling for Shell Oil, West Cameron Block 253
Penrod Drilling Company Submersible 196' x 108'	Rig 50	44'	Eugene Island Area
Penrod Drilling Company Submersible 150' x 190'	Rig 51	To 70'	Block 41, Main Pass Area
Penrod Drilling Company Submersible 198' x 174'	Rig 52	100'	Eugene Island Area
Placid Oil Co. Twin submersible hulls, each 72' x 178'	Petrel	To 100'	Eugene Island Area
Reading & Bates Offshore Drilling Company Self-elevating	"C. E. Thornton"	To 110'	Under tow to Persian Gulf
Rimrock Tidelands, Inc. Submersible	"Rimtide"		Stacked

OWNER	NAME	WATER DEPTH	PRESENT STATUS
Sea Drilling Corp. Submersible	"Seadrill 2"	30′	Waiting on location
Southeastern Drilling Corp. Submersible 111′ x 90′ x 156′ with four pontoons	Rig 22, Barge 8		Drilling for Texas Co., S. W. Marsh Island prospect, State Lease 340, OCS—0310, Well No. 3
Union Producing Co. Submersible 160′ x 190′	Unnamed	To 76′	Under construction at Todd Shipyards Corp., Houston, Texas
Universal Drilling Company Self-elevating	"Mr. Louie"	To 130′	Being outfitted in New Orleans
Zapata Off-Shore Company Self-elevating. 194′ x 152′ overall. Three 145′ legs	"Vinegar-roon"	To 80′	CATA Well #4, Block 45, West Delta, s/o 970
Zapata Off-Shore Company Self-elevating. 20′ x 80′ x 140′, with three triangular legs	"Scorpion"		On location Cay Sal Bank, Bahamas

Drilling Tenders

An-Son Offshore Drilling Co.	"Carl B. Anderson"		Drilling for CATC
The California Company Converted LST, 328′ x 50′	S-21	25′	Bay Marchand, Louisiana, Noble Drilling Co.
The California Company Converted LST, 328′ x 50′	S-22	49′	Bay Marchand, Louisiana, Loffland Brothers
The California Company Converted LST, 328′ x 50′	S-23		Being mothballed
The California Company LST, 328′ x 50′	S-24	37′	West Delta Area, Louisiana, Noble Drilling Co.
The California Company LST, 328′ x 50′	S-25		Bay Marchand, Louisiana Loffland Bros.
The California Company LST, 328′ x 50′	S-26		Standby. Venice, Louisiana. Loffland Bros. rig
Coastal-Marine Drilling and Construction Corp. New tender, 272′ x 56′	Howard S. Cole Jr. Coastal-Mariner No. 1		Sold to Pan American International for use in Persian Gulf
CATC Group New tender, 260′ x 54′	"J. C. Craig"	90′	Eugene Island, Block 208
CATC Group New tender, 260′ x 54′	"Carle Sharp"	101′	Ship Shoal, Block 199
CATC Group New tender, 260′ x 54′	"Ernie Miller"	50′	West Delta, Block 45
CATC Group New tender, 260′ x 54′	"Jack Cleverley"		Drydock
Deepwater Exploration Co. Converted LST, 328′ x 50′	"Deepwater No. 1"		Block 174, Ship Shoal area
Delta Marine Drilling Co. Converted LST, 326′ x 50′	"Joseph Zeppa"		Stacked
Gulf Oil Corporation New tender	"Dolphin"		Completed placed in moth ball fleet at Orange, Tex., engines pickled, and rig stacked
Gulf Oil Corporation Converted LST, 328′ x 50′	"Eagle"		Rig stacked at Morgan City, Louisiana
Gulf Oil Corporation New tender, 272′ x 60′	"Pelican"		Block 130, S. Timbalier area, Salt Dome Prod. Co.

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OWNER	NAME	WATER DEPTH	PRESENT STATUS
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-1		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-2		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-3		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-4		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-5		At Orange, Texas for storage
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-6		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-7		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-8		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-9		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-10		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-11		Standing by
Humble Oil & Refining Co. Converted LST, 328′ x 50′	ST-12		Standing by
Kerr-McGee Oil Ind., Inc. Converted YF, 260′ x 48′	"Kermac I" Rig 16		Waiting on location
Kerr-McGee Oil Ind. Inc. New Tender, 250′ x 50′	"Kermac II" Rig 43		Waiting on location
Kerr-McGee Oil Ind. Inc. New Tender, 250′ x 50′	"Kermac III" Rig 48		Waiting on location
Kerr-McGee Oil Ind., Inc. Converted YF, 260′ x 48′	"Frank Phillips" Rig 39		Waiting on location
Llano Drilling Company New tender, 260′ x 54′	"Clayton G. Dorn"		In drydock Orange, Texas
Magnolia Petroleum Co. Converted YF	"Gulf Coast Barge No. 2"		Out of Service
MCN Group Converted YF	MDT-1		Block 119, Eugene Island Area, Well C-6 drilling
MCN Group Converted YF	MDT-2		Out of Service
MCN Group Converted YF	MDT-3		Out of Service
MCN Group Converted YF	MDT-4		Out of Service
MCN Group Converted YF	MDT-5		Out of Service
MCN Group Converted YF	MDT-6		Out of Service
MCN Group Converted YF	MDT-7		Out of Service
Pan American Petroleum Corp. Converted LST, 328′ x 50′	"Pan American 50"		Orange, Texas
Phillips Petroleum Company Converted YF, 260′ x 48′	"K. S. Adams" Rig 40		Inactive
Reading & Bates Offshore Drilling Company	"J. W. Bates"		Under tow to Persian Gulf
Reading & Bates Offshore Drilling Company	"George M. Reading"	71′	Drilling in Block 120, Vermilion Area for CATC
Reading & Bates Offshore Drilling Company	"J. C. Craig"		Drilling in Block 208 Eugene Island Area for CATC

OWNER	NAME	WATER DEPTH	PRESENT STATUS
Southeastern Drilling Corp. Converted YF	Rig 12 Barge 9		Shut down, Industrial Canal, New Orleans
Zapata Off-Shore Company Converted YF, 260′ x 48′	"Nola No. 1"		Southern Shipbuilding Corp., Slidell, La.

Self-Contained Platforms

COMPANY	DESCRIPTION	YEAR BUILT	LOCATION	WATER DEPTH
Brewster Bartle Off-Shore Co.			Block 30, West Delta	50′
CATC Group	110′ x 146′	1956	Block 45, West Delta	50′
CATC Group	110′ x 146′	1957	Block 47, Grand Isle	88′
Dixilyn Drilling Corp. Rig #7	120′ x 145′	1956	Rig removed and in storage at Dupont's Bayou Bouef yard	
Gulf Marine Drilling, Inc. Rig #2			Bayou Bouef, awaiting location	
Gulf Oil Corporation	40′ x 100′	1957	Rig Stacked at Morgan City, La.	
Humble Oil & Refg. Co. Rig #50	78′ x 200′	1956	Block 16 Field, "J" Platform, Grand Isle Area	50′
Humble Oil & Refg. Co. Rig #54		1958	Shutdown	
Mecom Petroleums	82′ x 193′	1948	Rig removed from platform	34′
Phillips Petroleum Co.	85′ x 140′	1955	Block 184, Eugene Island Area, vacated, platform remains	84′
Phillips Petroleum Co.	88′9″ x 140′	1955	Block 129-A, Eugene Island Area, platform inactive	52′
Phillips Petroleum Co.	88′9″ x 140′	1956	Block 172, Eugene Island Area, vacated platform	77′
Phillips Petroleum Co.	88′9″ x 140′	1956	Block 191, Eugene Island Area, platform inactive	81′
Phillips Petroleum Co.	88′9″ x 140′	1957	Block 129, Eugene Island Area, platform inactive	57′
Pure Oil Company Converted LST	328′ x 50′	1958	Orange, Texas	
Pure Oil Company	52′ x 106 with 51′ x 82′ pipe rack	1957	Well completed, rig removed	72′
Shell Oil Company	55′ x 110′	1958	Block 176, Eugene Island Area	86′
Sinclair Oil & Gas Co.	118′ x 142′	1957	Block 175, Eugene Island area (wells shut in)	85′
Sinclair Oil & Gas Co.	118′ x 142′		In storage at McDermott Bayou Bouef yard	
Sinclair Oil & Gas Co.	80′ x -80′	1955	Block 15, South Timbailer Area, (well shut in)	7′
The Superior Oil Co.	96′ x 225′	1958	Drilling B-3, Block 76, Vermilion Area	
Union Oil Co. of California			B-1, Block 76, Vermillion Area, Southeastern Drilling Corp., Rig 7	

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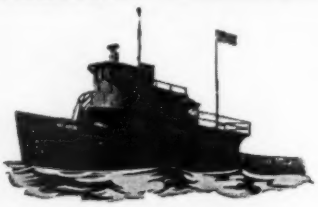

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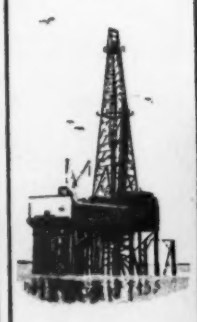

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Offshore gas seep . . .

(continued from page 20)

Kaikoura in New Zealand.

A skindiver detected the gas and collected some in bottles. Tests proved that it was methane. The Shell D'Arcy and Todd Oil Services combine obtained the details of the report that was made by the analyst.

Nigeria

San Bartholomeo River Bed Oil Discovery Is Announced

San Bartholomeo River's bed in the Niger delta has yielded a new oil discovery for Shell-BP Petroleum Development Company of Nigeria, Ltd.

Located at Ekulama, Degema Division, the 10,483-ft. wildcat has not been tested for production potential.

An unsuccessful venture at Miriegbe in Ogoni Division was abandoned at 10,516 ft.

Texas

Most Southeasterly Field Opened Near Ancient Slick

A discovery in Jefferson County south of Sabine Pass has opened the most southeasterly field in Texas.

The gas-condensate strike was drilled by North Central Oil Company seven miles from the nearest field. Just offshore from the well site is an oil slick which was discovered by Spanish explorers.

Daily production was 37,000 M.c.f. of gas with a gas-condensate ratio of 100 M.c.f. per bbl.

Venezuela

Second Rig Strike Finaled On Phillips Group's Acreage

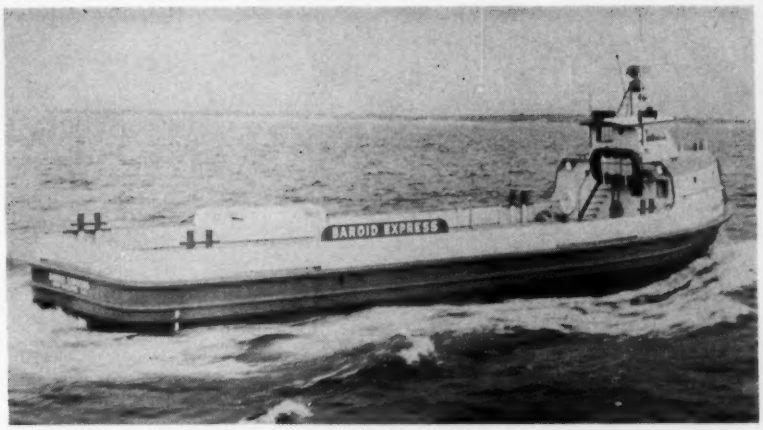
Phillips Petroleum Company has confirmed production in Lake Maracaibo's most southwesterly concession with another prolific oil producer.

Operating for a group rounded out by Sunray Mid-Continent, Ashland Oil and Refining Company, Western Natural Gas, El Paso Natural, Kerr-McGee Oil Industries, Inc. and Venezuelan Pacific Petroleum, Phillips drilled to a total depth of 13,015 ft. and completed the LPG 14-4 for a total flow of 7008 bbls. of oil per day.

Phillips drilled the second well on the block 3900 ft. north of the discovery well, which flowed 6600 bbls. of oil per day.

News from the SHIPYARDS

New Botruc Will Carry 125 Tons Of Mud



MUD VESSEL completed by Blount Marine for Baroid is powered by GM diesel at top speed of 12 knots. In addition to 125 tons mud capacity, it will also carry 40 additional tons.

A new 85-ft. vessel that can carry up to 125 tons of mud to offshore drilling rigs in the Gulf of Mexico has been completed by Blount Marine Corporation of Warren, Rhode Island.

Built for Baroid Division of National Lead Company, the **Baroid Express** has an extensive clear deck area for 40 tone of additional supplies.

Powered by two GM 6-110 engines developing 440 hp, it is capable of speeds up to 12 knots. The all welded steel vessel is 85 ft. 6 in. by 23 ft. by 5 ft. 8 in. draft and was designed and built similar to the standard 64 ft. 6 in. Blount Botruc. Drilling mud is pumped into two 10 ft. diameter mud tanks by air and mixed at the well site.

Comfortable quarters for four men are provided in the fo'c'sle which includes an all electric galley with stove, refrigerator, automatic hot water, stainless steel double sink, and adjacent dinette. Shower room is also located forward.

The **Baroid Express** is the fifth in a line of Botrucs built by Blount Marine. A sixth vessel now under construction will serve as a cargo carrier in the Caribbean.

Sewart Completes Semarca 12, First of New Crewboat Series

The first of a new series of offshore boats designed and built especially for George Engine Company, Inc. of Harvey, Louisiana, has been completed by Sewart Seacraft, Inc.

The 45-ft. twin screw cruiser is the **Semarea 12,** Powered by two GM diesel engines, the vessel has a cruising speed of 25 mph and is elaborately fitted for the comfort and convenience of passengers.

It has an all aluminum cabin of new design that gives the boat operator 360 degrees of visibility. The stern visibility is adequate for the operator to see the stern of the vessel as it approaches the dock.

Semarca 12 is the first of 11 similar vessels which George Engine will deliver to Tidewater Marine Service, C. A. of Maracaibo, Venezuela, a subsidiary of Tidewater Marine Service,

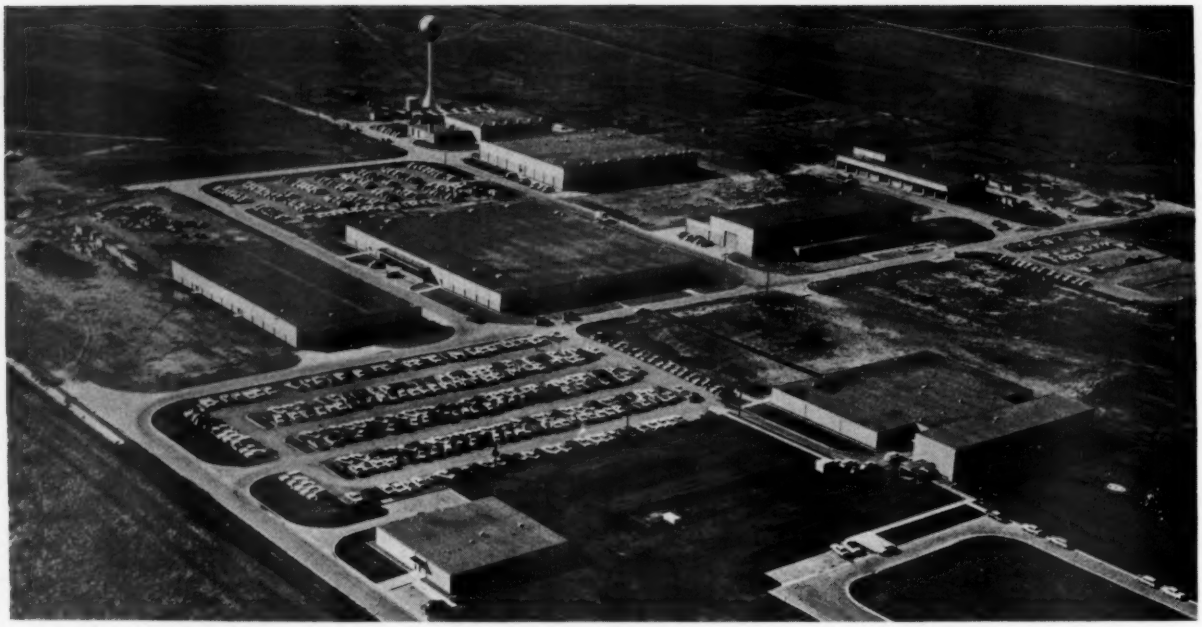
THIS 45-FT. twin screw cruiser is the first of a series of offshore vessels built for George Engine Company, Inc. of Harvey, Louisiana, by Sewart Seacraft, Inc. Two GM diesel engines drive it at a top speed of 25 mph, and it is built for passenger convenience and comfort.

Sewart's 1000th Vessel Will Operate as Crewboat

The 1000th vessel built by Sewart Seacraft, Inc. made its test run at Bayou Vista, Louisiana, recently.

The vessel, named the **Robert,** was

built for Service Boat Company of Berwick, Louisiana, to use as a crewboat. The 32-ft. steel hulled sedan cruiser shown above during its test run is powered by series 6-71 GM Diesel engines. Sewart's first boat was completed in 1945.



NEW SIE FACILITIES at Dresser Electronics Center in Houston, Texas, have more than 300,000 sq. ft. of air-conditioned manufacturing space on 146-acre site.

SIE completes . . .

New Electronics Center

After more than 13 years of operation Southwestern Industrial Electronics Company, a subsidiary of Dresser Industries, Inc., has just completed a new manufacturing facility in Houston, Texas, with more than 300,000 sq. ft. of floor space on a 146-acre site.

EXPANSION ENABLES faster, more economical production runs as typified in the assembly of electronic test equipment.

Known as the Dresser Electronics Center, the new plant provides space four times as great as previously available, and houses not only SIE divisions in the field of geophysical instrumentation, but also in industrial test and process control instrumentation, power supplies, automation and control equipment and military electronics.

In addition, SIE has built up a large business in heavy manufacturing, producing trucks, trailers and offshore units for its own seismic exploration equipment, for Dresser companies and for customers in many other industries.

SIE was organized in 1945 by Keith R. Beeman and Richard H. Parker to develop and manufacture test and exploration equipment. From this nucleus, the company has built up a line of high-quality, precision test instruments. The program included development of a novel transistor circuitry which has enabled the company to produce a line of transistorized power supplies featuring exceptional utility and performance. The transistor development work has been carried over into the fields of computers for petrochemical process control and complete systems for remote and automatic control of oil and gas pipe lines.

A new electronic controls system just installed by SIE for a major operator in Lake Maracaibo controls the entire test and production schedules of oil and gas wells in the lake.

SIE became a subsidiary of Dresser Industries, Inc., in March, 1956.

ONE-MAN REMOTE CONTROL from single central location utilizes dispatching console where functions and information are displayed. Typewriters print out received numerical data.

SERVICE PERSONALITIES . . In The NEWS

Hardy-Griffin Corporation Names Safford to Top Job

Joe Safford has been named vice president and general manager of Hardy-Griffin Engineering Corporation, a division of Atlas Pipe, Inc.

SAFFORD

Other new additions to the sales and service staff are W. L. Phillips and D. C. "Cliff" Mayes, divisional sales managers for the Houston area, and William B. Phillips and Warren Hill Parsons, who will also work out of the Houston office.

Safford was general manager and sales manager for Hardy-Griffin prior to his newest appointment. Previously he had been sales engineer for Mannesmann Tube So., Ltd., Canada's first automatic steamless pipe mill at Sault Ste Marie, Ontario, Canada.

New Technical Service Man Appointed By Ideco, Inc.

Charles E. Wright has been assigned to the Gulf Coast area as technical service representative for Ideco, Inc. of Dallas.

WRIGHT

He succeeds Berwin L. Price, who was transferred to Tulsa, Oklahoma, as technical service representative.

Wright, who has been with Ideco since 1953, was manager, pricing and specifications at the Beaumont, Texas, plant until his new appointment. He will continue to make his headquarters at the Beaumont plant.

Price joined Ideco in 1952 and served in the proposal department and in the export sales department.

Ideco, one of the Dresser Industries, has also announced that it was selected as exclusive export sales representative for Walker Well Heads, Inc.

Bain Named Salesman For Atlas Pipe on Gulf Coast

J. Doyle Bain has been named a salesman for Atlas Pipe, Inc. working out of the Corpus Christi plant.

Bain was previously with Wilson Supply Company for five years and with W. C. Norris Manufacturing Company for six years. He is a member of the API and AIME and has lived in Corpus Christi for ten years.

Atlas Pipe is a distributor for various pipe mills and operates pipe fabricating facilities at Houston and Corpus Christi.

Service Oil Tool Acquires Bowen Fishing Tool Stores

Purchase of the S. R. Bowen Division fishing tool stores by Service Oil Tool Company has been announced by T. M. "Tommy" Johnston, owner and president of the newly formed Service Oil Tool organization. Negotiations to buy the facilities were completed with Bowen Itco, Inc. of Houston.

JOHNSTON

Johnston, former executive vice president of Johnston Testers, Inc., of Houston and Los Angeles, says the personnel and facilities at Santa Fe Springs, California, will be moved to Long Beach where the home office will be located. All stores will use substantially the same personnel.

Morrison Named Sales Head Of Louisiana Engine Company

Dick Morrison has been appointed sales manager of Louisiana Engine Company, New Orleans. which began operations recently.

The new company handles Ford diesel engines and generators.

Duke Named Southern Division Manager for Johnston Testers

G. D. Duke, formerly assistant manager of field operations for Johnston Testers, has been named Southern Division manager with headquarters in Houston.

DUKE

The announcement followed the reorganization of the company's field offices into two divisions, sending B. R. Dixon, formerly assistant to the president, to Denver, Colorado, as manager of the northern division.

Duke joined Johnston Testers as a tester in 1946. He became successively manager of the Tyler district, the Houston district and the Kansas-Oklahoma area.

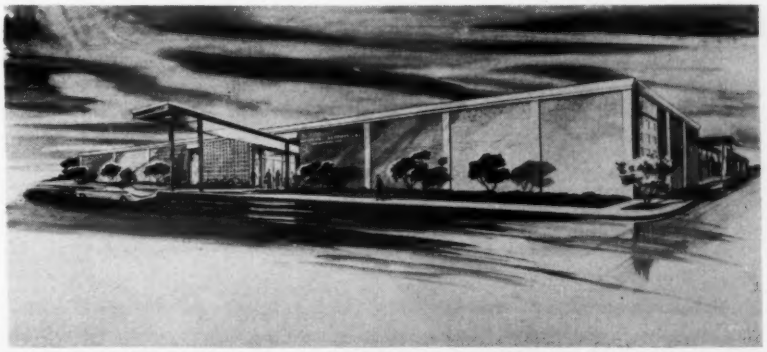
Birnie and Horner Accept New Jobs in Borg-Warner Divisions

A. M. Birnie has been named vice president and manager of sales for BJ Service, Inc., subsidiary of Borg-Warner Corporation of Los Angeles, California.

HORNER

V. C. Horner, former vice president and sales manager for Byron Jackson Tools, Inc. has been appointed vice president and general manager of BJ Electronics, Santa Ana, California.

(Continued on next page)



NEWLY COMPLETED plant at Dallas, Texas, will provide National Geophysical Company, Inc. with 50,000 sq. ft. of space for general offices, research laboratories, instrument manufacturing section, shops, warehouses, equipment outfitting division and lunchrooms. The facility has a dark smoke-brick exterior punctuated by periodic vertical panels of white marble.

POWER BY KENNEDY

. . . aboard this 32' all-steel crew boat whose 38.3 m.p.m. makes her the FASTEST boat of her type IN THE WORLD. Twin screw, she was built by Equitable Equipment Co. of New Orleans and is powered by two GM Series 6-71B marine diesel engines supplied by . . .

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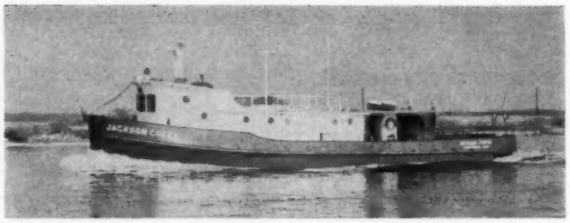

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(Continued from preceding page)

Both BJ Tools and BJ Electronics are branches of Borg-Warner.

Birnie, who will establish his office at the Ft. Worth, Texas, headquarters of BJ Service, has been executive vice president of Security Engineering Company of Dallas since 1951.

Horner had been with Byron Jackson since 1941.

Southern Marine Appoints Treadway Vice President

William L. Treadway, Jr. has been elected a vice president of Southern Marine and Aviation Underwriters, Inc.

Since 1948 Treadway has traveled the South for fire and casualty companies as state agent and field representative. More recently he has been affiliated with an international insurance brokerage firm.

Treadway was born in Atlanta, Georgia, attended Georgia Military Academy and later Georgia Tech. During World War II he served in the Navy in the Pacific.

Southern Marine and Aviation Underwriters, based at New Orleans, is one of the South's largest surplus line offices which offers offshore and inshore oil insurance as a specialty.

HOMCO Appoints Ambrose To Executive Vice President

Z. C. Ambrose of Houston has been named executive vice president of Houston Oil Field Material Co., Inc., world's largest independent oil field service and supply company.

AMBROSE

Since 1954, Ambrose has been with Associated Oil and Gas Company and was president of that company for the past year. He was also president of Prince Marine Drilling and Exploration Company.

Before going with Associated, Ambrose was vice president and manager of Southwest Gas Producing Company and Carbons Consolidated, Inc. and president of Monla Gas Company, all of Monroe, Louisiana. He was also a director of these companies as well as their parent company, Commonwealth Gas Corporation of New York City.

A native of Kentucky, Ambrose received a degree from the University of Oklahoma.

Pneumatic Truck Speeds Delivery of Bulk Mud

On a recent job in Galveston Bay, 2000 sacks of weight material was delivered to location by only two men in four hours.

Normally, such a delivery would require 12 men and 14 hours, but a pneumatic truck developed for the delivery of bulk mud to the well site greatly speeds up delivery.

The new bulk truck, developed through the efforts of V. R. Burch, upper Texas Gulf Coast area manager for Baroid Division, National Lead Company, also reduces the risk of accidents that may occur while transferring sack material from barge to offshore platform.

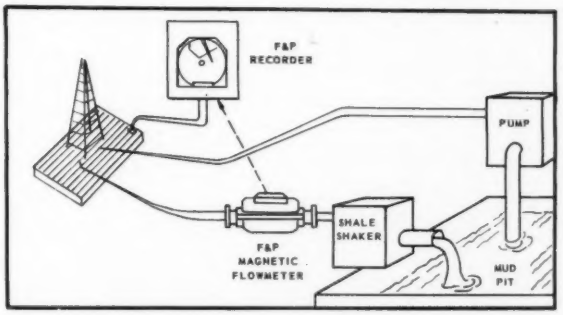
Its outstanding feature is the pneumatic unloading system. In operation, a blower driven by the power take-off on the truck engine supplies air to a Sprout-Waldron blow-through air-lock feeder at about 400 cu. ft. of air per minute at a pressure of 14 pounds psi. The blower not only moves the weight material through a flexible hose for a considerable distance, but also supplies necessary aeration of the weight material through a porous bottom in the truck bed; thus eliminating the need for additional blowers. The function of the feeder

is to transfer the weight material to the air stream from the truck bed at a nearly constant rate.

For further information write Baroid Division, National Lead Company, P. O. Box 1675, Houston, Texas.

Mud Flow Measured by Accurate System

A practical system has been developed for measuring mud flow rate accurately where there are deep wells and high pressures such as those encountered offshore. Using the new device, the driller can get immediate indication of an impending blowout and can determine what is causing mud loss or reduced circulation.



The new recorder, developed by Fischer and Porter Company, is described in a new bulletin entitled "Measuring the Flow of Drilling Mud With the F&P Magnetic Flowmeter."

The device is usually installed between the well outlet and the mud pit just in front of the shale shaker. It consists of a straight pipe surrounded by coils that have been energized, causing a magnetic field to be imparted across the meter pipe section. When the flowing mud cuts the lines of the magnetic field, a small voltage is generated and picked up by the probes mounted flush with the inner diameter of the pipe section. This voltage becomes a measure of the rate of mud flow.

For further information write Fischer and Porter Company, 838 Jacksonville Road, Hatboro, Pennsylvania.

Toolpusher's Manual Published by AAODC

"The Toolpusher's Manual," a comprehensive technical volume designed for on-the-job use by toolpushers in the field, has been produced by the American Association of Oilwell Drilling Contractors.

The manual contains more than 500 pages of technical information ranging from bits, pipe to wire rope which is classified and indexed in alphabetical order.

It is loose-leaf bound to permit substitution of data and inclusion of new information. It is printed on Texoprint, a plastic-coated and impregnated paper, which resists molds, moisture, bugs and dirt and can be cleaned easily.

More than 3500 copies of the Toolpusher's Manual have been sold although the price per copy ranges from $24 to $33 depending on the type of binder ordered.

The manual has proved its on-the-job worth in both Canada, where the paper does not lose its flexibility despite the extreme low temperature conditions encountered there, and on the offshore rigs in the Gulf of Mexico where the paper is subject to heat, high humidity and salt spray.

For further information write American Association of Oilwell Drilling Contractors, 505 N. Ervay, Dallas 1, Texas.

High Speed Counter Utilizes Robot Eye

Reliable industrial counting at speeds over 1500 a minute may now be accomplished with Robot-Eye RE-8 Photo-Electronic Counter.

Manufactured by Standard Instrument Corporation of New York, Robot-Eye counts by interrupted or reflected light beam. There is no physical contact with objects being counted.

The new counter embodies a six-digit plug-in counter, which has a life of over 100,000,000 counts. Replacement counter element simply plugs in, extending instrument life indefinitely. Counter resets to zero at the touch of a button.

For further information write Standard Instrument Corporation, 657 Broadway, New York 12, N. Y.

Logging System Gives 5 Records on One Run

An exciting new development in oil well velocity logging is a system which gives five simultaneous logging records on one run of the tool.

The multi-purpose logging system is the VS Acoustic log, announced by Empire Geophysical, Inc. of Fort Worth after three years of developing and testing.

In use the Empire VS Acoustic log has these simultaneous features: single receiver Acoustic log; dual receiver Acoustic log with choice of one, two, and three-ft. spacing of receivers and switching in the hole; choice of accompanying SP or gamma-ray log; dual receiver linear velocity curve; and integrated travel time.

For further information write Empire Geophysical, Inc., 6000 Camp Bowie Boulevard, Fort Worth, Texas.

Plastic Pipe Fittings Make Jointing Quick

Victaulic Company of America, Elizabeth, N. J., has announced a complete line of full-flow molded plastic pipe fittings with grooved ends, for quick-jointing plastic pipe with Victaulic mechanical couplings.

The Victaulic coupling method is particularly well suited to plastic piping systems, according to the manufacturer, because the coupling absorbs expansion and contraction of the plastic pipe. The quick-coupled joints can also be put into service immediately.

For further information write Victualic Company of America, P. O. Box 509, Elizabeth, New Jersey.

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15,000-ft. test spudded . . .

Gulf To Drill Off Florida

Test is being drilled in 18 ft. of water next to acreage recently put up for lease by the government

A wildcat projected to 15,000 ft. has been spudded by Gulf Oil Corporation 15 mi. west of Key West, Florida.

The offshore lease on which the well is being drilled adjoins acreage which the California Company has tried to lease from the government. When the federal government asked for nominations recently, only the California Company responded. However, since their nomination of 60 blocks totaling 346,000 acres was the only one, the government may postpone further lease activity.

Drilling the test in 18 ft. of water is a submersible mobile unit owned by Kerr-McGee Oil Industries, Inc., Rig 45. Gulf is drilling on one of nine leases originally belonging to Commonwealth Oil Company with which it has an agreement.

Oil Discovery Is Completed Off Terrebonne Parish, La.

An oil discovery has been completed by Sinclair Oil and Gas Company in Ship Shoal Block 153 30 mi. off Terreboone Parish, Louisiana, in the Gulf of Mexico.

The discovery, drilled from a mobile platform in 60 ft. of water, is west of the Ship Shoal Block 154 field. Designated No. 5 Ship Shoal Block 153, it flowed 174 bbls. of 32-gravity oil per day on a 10/64-in. choke. Production is from a Pliocene sand with perforations at 6511 ft. to 6324 ft.

Conoco Drilling Third Test On Gulf of Paria Concession

Continental Oil Company is continuing its wildcat program in the Gulf of Paria, although the second well on new acreage was dry.

A third test is already drilling below 11,000 ft. and indications point to more exploration. Continental is doing the drilling on the 151,450-acre concession for a group made up of itself, Ohio Oil Company, The Texas Oil Company, Cities Service Oil Company and Richfield Oil Corporation.

The initial discovery was dually completed opening a field that will be developed by the drilling of several field wells this year.

Gasser Opens New Reservoir In Vermilion Block 76 Field

A high volume gasser recently tapped a new reservoir in Vermilion Block 76 Field off Vermilion Parish, Louisiana.

Superior Oil Company's No. B-3 OCS-0249 (State Lease 1106) yielded 6,634,000 cu. ft. of gas per day on 22/64-in. choke. The 9500-ft. well, cased with 7⅝-in. pipe, is perforated at 9086—94, 9100-20, and 9128-38 ft.

With a tubing pressure of 2666 lbs., the well flowed 14 bbls. of 44.4-gravity condensate at a gas-condensate ratio of 47,215 to 1.

Wildcat Finaled as Gasser In West Cameron Block 68

A wildcat well in Block 68 of the West Cameron area has flowed 2.1 million cu. ft. of gas and 67 bbls. of 48.2-gravity condensate per day.

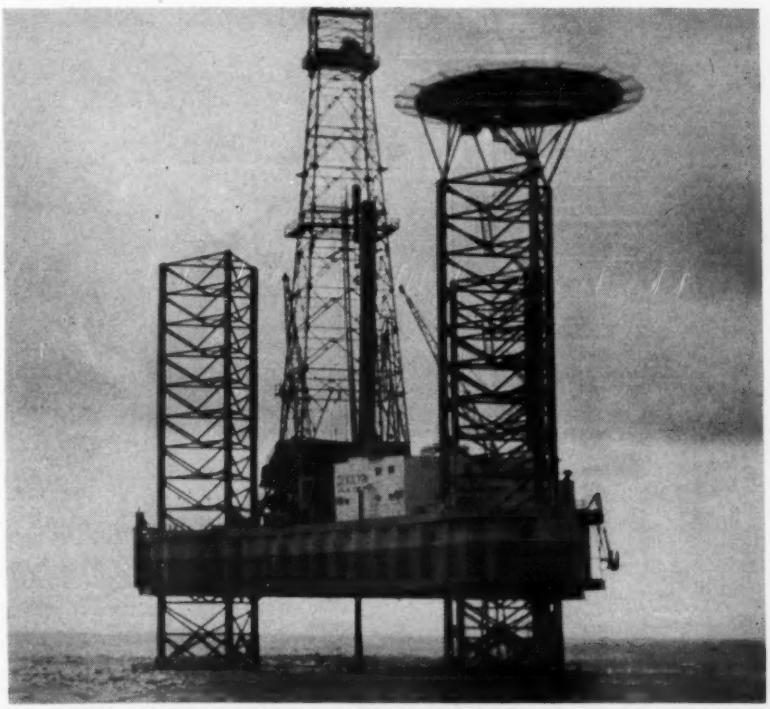
The discovery is No. A-1 OCS-0526 drilled to a total depth of 16,110 ft. by J. Ray McDermott and Company. The operator cemented 9⅝-in. casing at 13,088 ft. and perforated at the interval of 12,800 ft. to 12,820 ft. A flowing tubing pressure of 4950 lbs. was recorded.

Second U. S. Lake Erie Test To Begin in Early Spring

If the ice recedes from Lake Erie in time, the second wildcat on the American side of the lake will be spudded in next month.

New York Natural Gas Corporation will drill the venture 3.6 mi. from the Pennsylvania shore. Located seven mi. from the New York border, the well will initiate New York Natural's second year of drilling in Lake Erie.

Last year the Pittsburgh firm completed the first offshore gas well on the American side of the lake. The discovery, which flowed 200,000 cu. ft. of gas per day, after it was fractured, was shut in until the company could decide how to utilize the gas.



Fifty miles offshore in 100-ft. water in Vermilion Block 164, the mobile unit JULIE ANN is drilling a wildcat for Shell Oil Company. Last spring this marine mammoth began its offshore career with a discovery completed in three zones for total production of 725 bbl. per day. Owned by Dixilyn Drilling Corporation, it can drill in water depths greater than 100 ft.

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Not included in the index are regular monthly features of tabular material. See each issue for listings of "Momile Units, Tenders, and Self-Contained Platforms," and check the August 22 Annual Marine Drilling and Producing Edition for statistics on production and for the World-Wide Round-Up of Marine Drilling Rigs.

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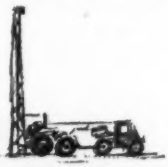

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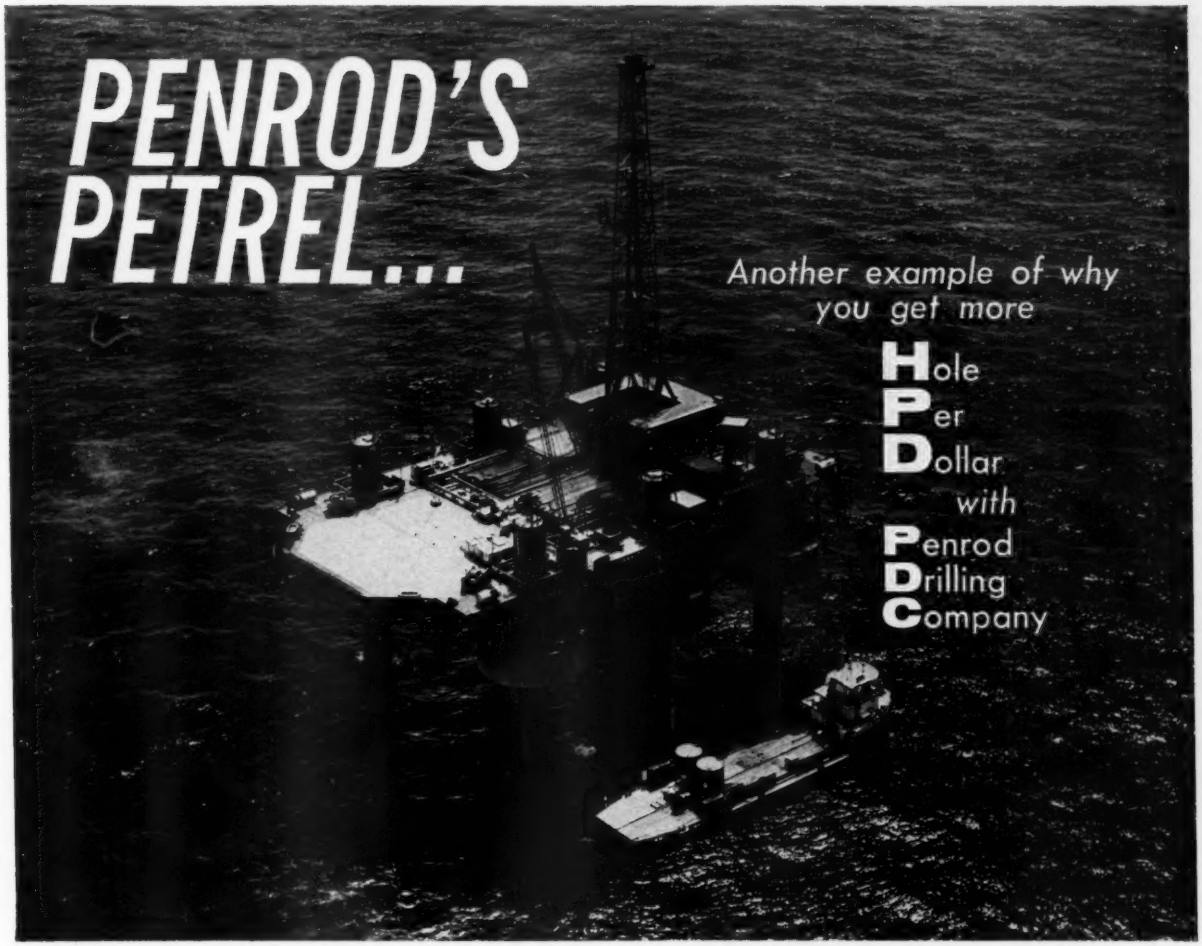

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